144-248

RECORD, CASE No. 13,263.

804

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1891.

TERM No., 207.

THE POPE MANUFACTURING COMPANY, APPELLANT,

vs.

THE GORMULLY AND JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, AND THOMAS B. JEFFERY.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF ILLINOIS.

FILED OCTOBER 11, 1888.

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1 Pleas in the circuit court of the United States for the northern district of Illinois held at the United States court-rooms, in the city of Chicago, in the district aforesaid, before the Hon. Walter Q. Gresham, judge of the circuit court of the United States for the seventh judicial circuit, and the Hon. Henry W. Blodgett, judge of the district court of the United States for the northern district of Illinois, on Monday, the thirtieth day of April, in the adjourned March term of said court, in the year of our Lord one thousand eight hundred and eighty-eight, and of our Independence the one hundred and twelfth year.

WM. H. BRADLEY, *Clerk.*

THE POPE MANUFACTURING COMPANY
vs.
THE GORMULLY AND JEFFERY MANUFACTURING Company, R. Philip Gormully, and Thomas B. Jeffery. } 20544. In Chancery.

NORTHERN DISTRICT OF ILLINOIS, *ss:*

Be it remembered that on the seventh day of April, 1887, came the complainant, by its solicitors, and filed in the office of the clerk of the circuit court of the United States for the northern
2 district of Illinois, at Chicago, in said district, its bond for costs and bill of complaint in said entitled cause; which said bond and bill are respectively in the words and figures following, to wit:

Bond for Costs.

UNITED STATES OF AMERICA, } *ss:*
Northern District of Illinois, }

Circuit Court, May Term, A. D. 1887.

THE POPE MANUFACTURING CO.
vs.
GORMULLY & JEFFERY M'F'G CO. *et al.* } In Equity.

I enter myself security for costs in this cause and promise to pay all costs which may accrue to the opposite party in this action or to any of the officers of this court, and in default of payment by the complainant of any costs ordered or adjudged to be paid by it I hereby agree and stipulate that execution may issue against my property for any costs taxed against it, the complainant.

Dated this seventh day of April, A. D. 1887.

H. H. TALCOTT.

Endorsed: Filed April 7, A. D. 1887. Wm. H. Bradley, clerk.

3 United States Circuit Court, Northern District of Illinois.

THE POPE MANUFACTURING COMPANY
vs.
GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, and THOMAS B. JEFFERY. } In Equity.

To the honorable the judges of the circuit court of the United States within and for the northern district of Illinois, in chancery sitting:

Your orator, The Pope Manufacturing Company, a corporation duly established by law and having its principal place of business in Boston, in the State of Massachusetts, and a citizen of the State of Massachusetts, brings this its bill of complaint against the Gormully & Jeffery Manufacturing Company, a corporation duly
4 established by law and having its principal place of business at the city of Chicago, in the northern district of Illinois, R. Philip Gormully and Thomas B. Jeffery officers and managers of said corporation, both residing in said Chicago, and both citizens of the State of Illinois; whereupon your orator, complaining, says:

That the complainant has been for a number of years a large manufacturer and dealer in bicycles and tricycles and other velocipedes, and in the saddles, springs, and other parts and accessories of and for such velocipedes or vehicles, and has carried on and is carrying on an extensive business within and throughout the United States; that in the transaction of said business and as necessary and incidental thereto it has acquired the title to and become posseseed of and still possesses a large number of inventions and letters patent of the United States relating to devices and combinations involved in the construction of the above-named bicycles, tricycles, and other velocipedes, and in the saddles, springs, and other parts and accessories thereof and therefor, and that among the said inventions and letters patent of the United States therefor are those hereinafter recited.

Your orator further shows that before the 3d day of June, 1879, John Shire was the first and original inventor of a new and useful improvement in velocipedes not known or used by others prior to his said invention and not in public use or on sale, with his knowledge or consent, for more than two years prior to his application for a patent therefor, as your orator verily believes.

And your orator further says that on said June 3, 1879, on due application therefor by the said John Shire, letters patent of the United States for his said invention in due form of law were
5 issued and delivered to the said John Shire in the name of the United States of America and under the seal of the Patent Office and were signed by the Secretary of the Interior and countersigned by the Commissioner of Patents and numbered 216,231, whereby there was granted to the said John Shire, his heirs and assigns, the exclusive right to make, use, and vend to others to be used, for the term of seventeen years from the date of said patent, said improvements and inventions within, for, and

throughout the United States and the territories thereof, *read in* as by said letters patent, with the specification and drawings accompanying the same and made part thereof, ready in court to be produced, will more fully and at large appear. A copy of the specification and drawings of said last-named letters patent is annexed to and made part of this bill and marked "Exhibit A."

Your orator further shows that one Thomas J. Kirkpatrick, before the 17th day of March, 1885, was the first and original inventor of certain new and useful improvements in bicycle saddles not known or used prior to his said invention and not in public use or on sale, with his consent or allowance, for more than two years prior to his application for a patent therefor, as your orator verily believes.

And your orator further shows that on said March 17, 1885, on due application therefor by the said Thomas J. Kirkpatrick, letters patent of the United States for his said invention, in due form of law, were issued and delivered to the said Thomas J. Kirkpatrick in the name of the United States of America and under the seal of the Patent Office and were signed by the Secretary of the Interior and countersigned by the Commissioner of Patents and numbered
6 314,142, whereby there was granted to the said Thomas J. Kirkpatrick, his heirs and assigns, the exclusive right to make, use, and vend to others to be used, for the term of seventeen years from the date of said patent, said improvements and inventions within, for, and throughout the United States and the territories thereof, as by said letters patent, with the specification and drawings accompanying the same and made part thereof, ready in court to be produced, will more fully and at large appear. A copy of the specification and drawings of said last-named letters patent is annexed to and made part of this bill and marked "Exhibit B."

And your orator further shows that by mesne assignments, duly executed and recorded in the office of the Commissioner of Patents prior to the commencement of this suit, all the right, title, and interest of the said John Shire in and to said letters patent No. 216,231 and in and to the inventions secured thereby, and of the said Thomas J. Kirkpatrick in and to said letters patent No. 314,142 and in and to the inventions secured thereby, became each and every one of them vested in your orator prior to the infringements herein complained of, and your orator became and ever since said respective assignments has been and now is entitled to and possessed of the full and exclusive right and liberty of making, constructing, using, and vending to others to be used bicycles, tricycles, velocipedes, seats for tricycles and other velocipedes, and saddles for bicycles and other machines, and parts and devices embodying in their construction and mode of operation the aforesaid respective inventions or either of them within and throughout the United States and territories thereof, as in and by said assignments or duly authenticated copies thereof, here in court to be produced, will more fully appear.
7 That the said several inventions described and recited in said several letters patent Nos. 216,231 and 314,142 are of such a character as to be capable of conjoint as well as separate use in the construction and operation of bicycles and other velocipedes

and of bicycle saddles and of seats for bicycles and other velocipedes, and that they have been so used conjointly as well as separately by the defendants herein unlawfully and without the consent of your orator, and that each of the said bicycle saddles and seats for velocipedes herein complained of as made, used, and vended to others to be used by the defendants did and does embody in its construction and mode of operation the invention shown, described, and claimed in the aforesaid letters patent No. 216,231 and No. 314,142.

And your orator further shows that the said several inventions have hitherto been in the exclusive possession of your orator and its assignors, and that your orator has used said several grants and has profited thereunder since said respective assignments to it in connection with its business of manufacturing and selling bicycles, tricycles, and other velocipedes, and bicycle saddles and seats for bicycles and other velocipedes as aforesaid, and with the exclusive right secured by the said letters patent for it ever since the issuing of the same generally acquiesced in and respected by the public, and that your orator has endeavored to make said grants of profit and value to itself and of benefit and advantage to the public, and has put a large number of said machines and devices containing said inventions upon the market and has established branch houses and agencies whereby the business of making and selling said velocipedes and seats and saddles containing the improvements secured by the aforesaid letters patent has hitherto been and may be,
8 but for the infringements by the defendants, controlled throughout the United States in the interests of your orator and its agents and its licensees under other patents as well as in the interests of the public, and that your orator and its agents is and are ready and able to supply all reasonable demands of the public for such machines and devices, and that the importers, manufacturers, and dealers in bicycles, tricycles, and other velocipedes and in seats and saddles for the same, doing business in the United States, have acknowledged the validity of said several letters patent and the title of your orator to the inventions therein and thereby claimed and secured, and the rights and claims of your orator under said several letters patent have been and are generally acquiesced in and respected, and that your orator has duly notified and requested the defendants repeatedly not to infringe its said exclusive rights secured as aforesaid, but the defendants refuse to desist.

That the defendants, The Gormully & Jeffery Manufacturing Company, R. Philip Gormully, and Thomas B. Jeffery, well knowing the premises, but contriving to injure your orator and without your orator's consent and without right and in violation of said respective letters patent and each of them and in infringement of the claims thereof, have made, used, and vended to others to be used and still do make, use, and vend to others to be used in the United States a large number of machines and devices called velocipedes and bicycle saddles and seats for bicycles and other velocipedes embodying the inventions patented as aforesaid or material or substantial parts thereof, and has combined and caused to be combined said seats for

bicycles and other velocipedes and said bicycle saddles with
9 bicycles and other velocipedes so as to embody the inventions patented as aforesaid or material or substantial parts thereof, and hereby has infringed and still does infringe and threatened and leads your orator to believe that in the future he will infringe upon the exclusive rights of your orator in said letters patent and the inventions thereby secured as aforesaid.

That the aforesaid doings and actions of the defendants are in defiance of your orator's rights as aforesaid and are to its irreparable loss and injury and deprivations of large profits which it ought to and otherwise would receive, but which are now received by the defendants, and are to the detriment, injury, and discontent of your orator and its agents; and how many of velocipedes and seats for bicycles and other velocipedes and bicycle saddles, and how many combinations of said seats and saddles with bicycles and other velocipedes said defendants have so made, constructed, used, or sold to others to be used, or is now making, using, or selling to others to be used, your orator is ignorant, but is informed and believes, and therefore avers, to a very large number.

To the end, therefore, that the defendants may show cause why your orator should not have the relief herein prayed and may *answer* (but not upon oath, an answer under oath being hereby waived) full, true, and direct answers make to the premises herein as fully as if particularly interrogated thereto;

That the defendants and their agents, servants, attorneys, and employees and each of them may be enjoined, not only perpetually but during the pendency of this suit, from said infringement of said respective letters patent, whether separately or conjointly; that the defendants may account to your orator for all bicycles and other velocipedes and for all material and substantial
10 parts and accessories thereof made, sold, or used by them as aforesaid in violation of your orator's exclusive rights and for all previous royalties received by them from the manufacture, selling, or use thereof; that the defendants may be decreed to pay the costs of this suit; that damages to the amount of twenty thousand dollars may be adjudged to your orator against the defendants for said violation of its exclusive rights and for said infringements; that your orator may have such other and further relief as equity may require and to your honors shall seem meet—

May it please your honors to grant to your orator not only a writ or writs of injunction, conformable to the prayer of this bill, but also a writ or writs of subpœna, to be directed to the said Gormully & Jeffery Manufacturing Company, R. Philip Gormully, and Thomas B. Jeffery, commanding them, under certain penalties therein to be named, to be and appear before this honorable court, then and there to answer this bill of complaint, and to do and receive what — your honors shall seem meet in the premises.

And your orators will ever pray, etc.

THE POPE M'F'G CO.,
By ALBERT A. POPE, *Pres't.*
COBURN & THATCHER, *Sol'rs.*
L. L. COBURN, *Of Counsel.*

11 UNITED STATES OF AMERICA, }
Northern District of Illinois. }

STATE OF MASSACHUSETTS, }
County of Suffolk, } *ss:*

On this fifth day of April, 1887, personally appeared before me Albert A. Pope and made oath that he is president of the above-named complainant corporation; that he has read the foregoing bill by him signed in behalf of the complainant corporation, and that the same is true of his own knowledge, except as to those matters therein stated on information, and as to those matters he believes it to be true.

[SEAL.] CHARLES E. PRATT,
Notary Public.

Endorsed: Filed April 7, 1887. Wm. H. Bradley, clerk.

12 On the same day, to wit, on the seventh day of April, 1887, there issued out of said clerk's office a writ of subpœna in said entitled cause; which said writ, together with the return of the marshal endorsed thereon, is in the words and figures following, to wit:

Subpœna.

UNITED STATES OF AMERICA, }
Northern District of Illinois, } *ss:*

The United States of America to Gormully & Jeffery Manufacturing Company, R. Philip Gormully, and Thomas B. Jeffery, Greeting:

We command you and every of you that you appear before our judges of our circuit court of the United States of America for the northern district of Illinois, at Chicago, in said district, on the first Monday in the month of May next, to answer the bill of complaint of the Pope Manufacturing Company this day filed in the clerk's office of said court, in said city of Chicago, then and there to receive and abide by such judgment and decree as shall then or thereafter be made, upon pain of judgment being pronounced against you by default.

To the marshal of the northern district of Illinois to execute.

13 Witness the Hon. Morrison R. Waite, Chief Justice of the Supreme Court of the United States of America, at
[SEAL.] Chicago aforesaid, this seventh day of April, in the year of our Lord one thousand eight hundred and eighty-seven, and of our Independence the 111th year.

WM. H. BRADLEY, *Clerk.*

Memorandum.

The above-named defendants are notified that unless they and each of them shall enter their appearance in the clerk's office of said

court, at Chicago aforesaid, on or before the day to which the above writ is returnable the complainant's bill will be taken against them as confessed and a decree entered accordingly.

WM. H. BRADLEY, *Clerk.*

Marshal's Return.

I have served the within writ within my district in the following manner, to wit: Upon Gormully and Jeffery Manufacturing Company therein named by delivering a true copy thereof to R. Philip Gormully, president of the said company, on the 8th day of April, A. D. 1887; also upon R. Philip Gormully therein named on the 8th day of April, A. D. 1887; also upon Thomas B. Jeffery
14 therein named on the 8th day of April, A. D. 1887, by personally delivering to each of them a true copy of the same on the aforesaid day.

F. H. MARSH,
U. S. Marshal,
By GEO. N. JONES, *Deputy.*

Endorsed: Filed April 8, A. D. 1887. Wm. H. Bradley, clerk.

Afterwards, to wit, on the second day of May, 1887, came the defendants, by their solicitors, and filed in said clerk's office their appearance in said entitled cause; which said appearance is in the words and figures following, to wit:

Appearance.

United States Circuit Court, Northern District of Illinois.

THE POPE MANUFACTURING COMPANY *vs.* GORMULLY AND JEFFERY MANUFACTURING COMPANY, R. Philip Gormully, and Thomas B. Jeffery.	In Chancery.

The clerk of said court will please enter our appearance
15 as solicitors for the defendants in the above-entitled cause.

OFFIELD & TOWLE,
Sol'rs for Def'ts.

To Wm. H. Bradley, Esq., clerk.

Chicago, May 2, 1887.

Endorsed: Filed May 2, 1887. Wm. H. Bradley, clerk.

Afterwards, to wit, on the sixth day of June, 1887, came the defendants, by their solicitors, and filed in said clerk's office their answer to the bill in said entitled cause; which said answer is in the words and figures following, to wit:

16 United States Circuit Court, Northern District of Illinois.

THE POPE MANUFACTURING COMPANY
vs.
THE GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, and THOMAS B. JEFFERY. } No. 845. In Equity.

The joint and several answer of the Gormully & Jeffery Company and "R. Philip Gormully and Thomas B. Jeffery, officers and managers of said corporation," to the bill of complaint exhibited against them by the above-named complainant, The Pope Manufacturing Company.

These defendants, now and at all times hereafter, saving and reserving to themselves all and all manner of benefit and advantage of exception which may be had or taken to any and all matters contained in said bill of complaint, or which may be had or taken to the many errors and insufficiencies in said bill of complaint contained, for answer thereunto, or unto so much or such parts thereof
17 as they are advised it is necessary or material for them to make answer unto, answering, say:

First. That these defendants have no knowledge, information, or belief as to whether the complainant, The Pope Manufacturing Company, is a corporation duly organized and established by law and a citizen of the State of Massachusetts, save from the allegation in that regard contained in said bill of complaint, and do not admit that the said complainant is a corporation organized or operating as alleged, and therefore pray that said complainant may be required to make due proof thereof in this cause.

Second. That these defendants have no information sufficient to form a belief as to the extent of the manufacture by the complainant of bicycles, tricycles, and other velocipedes, saddles, springs, and other parts and accessories of and for such velocipedes and vehicles, as alleged in said bill of complaint, or as to the further allegation that the said complainant has acquired title to and become possessed of and still possesses a large number of inventions and letters patent of the United States relating to devices and combinations involved in the construction of bicycles, tricycles, and other velocipedes, and in saddles, springs, and other parts and accessories thereof, and leave the complainant to make such proof thereof as it may be advised.

Third. That these defendants admit upon information and belief alone that certain letters patent of the United States were issued to one John Shire, dated June 3, 1879, and numbered 216,231, for alleged improvements in velocipedes; also that certain letters patent of the United States were issued to one Thomas J. Kirkpatrick, dated March 17, 1885, and numbered 314,142, for alleged improvements in bicycle saddles.

18 Fourth. That these defendants, further answering, upon information and belief deny that the said John Shire, prior to the third day of June, A. D. 1879, or at any other time, was the orig-

inal and first inventor of certain improvements in velocipedes, as alleged in said bill, or any material or substantial part thereof, and deny that said pretended invention or inventions had not been in public use and on sale in the United States for more than two years prior to the time of his application for letters patent therefor in the United States, with his consent and allowance, and deny that said alleged invention of said letters patent was new and useful.

Fifth. That these defendants, further answering, on information and belief answering, say:

1. That the alleged invention or discovery described and claimed in said letters patent No. 216,231 was not and is not an invention or discovery or the proper subject-matter of letters patent of the United States, and that the same was and is the result of mere mechanical skill and judgment.

2. That the alleged invention or discovery described and claimed in said letters patent No. 216,231, or a substantial part or substantial parts thereof, had been, prior to the alleged invention or discovery thereof by the said John Shire, described and shown in the specifications and drawings and patented in the following letters patent:

Letters patent to C. H. Harris, dated May 25, 1875, No. 163,769, for spring saddles.

Letters patent to Jacob H. Gibson, assignor to Peck & Baker, dated June 2, 1874, No. 151,660, for velocipede.

Letters patent to Samuel S. Spurgin, dated March 26, 1867, No. 63322, for riding saddle.

Letters patent to Robert Smith, dated August 28, 1849, No. 6682, for spring-seat saddles.

19 Letters patent to Palmer & Beards, dated June 12, 1835, for spring-seat riding saddle.

Letters patent to John L. Sommerville, No. 155,897, dated October 13, 1874, for spring saddle seats.

Letters patent to John Curry, No. 63864, dated April 16, 1867, for improvements in saddles.

Letters patent to J. C. F. Solomon, No. 8536, dated November 18, 1851, for riding saddle.

Letters patent to John C. Miller, No. 53854, dated April 10, 1866, for improved spring saddle.

Letters patent to Lewis Bishop, dated January 4, 1859, No. 22480, for improvement in elastic saddles.

Letters patent to George F. Schmidt, No. 115,772, dated June 6, 1871, for improvement in riding saddles.

British letters patent No. 3934 of 1879.

British letters patent No. 4321 of 1818.

British letters patent No. 3849 of 1879.

British letters patent No. 1647 of 1879.

Sixth. That these defendants, further answering, answer and say that the alleged invention or improvement of the said John Shire, and purporting to be claimed in said letters patent No. 216,231, or material and substantial parts thereof were fully described and shown in printed publications prior to any alleged invention by the said Shire, viz., in the printed copies of the specifications and draw-

ings of each of the above English letters patent, printed in London, England, by George Edward Eyre and William Spottiswoode, printers to the Queen's most excellent majesty, and published in the years of their respective dates, and were and have been accessible to the public in the United States in various public libraries in the United States, and particularly in the public library in Boston, Massachusetts, on or about the respective dates of said publications.

20 Seventh. That these defendants, further answering, upon information and belief deny that the said John Shire was the original and first inventor or discoverer of any material or substantial part of the alleged invention or discovery described and claimed in said letters patent No. 216,231, but, to the contrary, aver and charge that the same or substantial parts thereof had been known and used in this country, before the date of the alleged invention or discovery thereof by the said John Shire, to and by the following-named parties and at the following-named places:

George W. Marble, of Chicago, in the State of Illinois, at said Chicago.

Charles E. Duryea, of St. Louis, in the State of Missouri, at said St. Louis.

Thomas B. Jeffery, of Chicago, in the State of Illinois, at said Chicago.

Charles H. Harris, of Cedartown, in the State of Georgia, at said Cedartown.

A. S. Harris, of said Cedartown, in the State aforesaid, at said Cedartown.

William S. Kelley, of Smithville, in the State of New Jersey, at said Smithville.

Eighth. That these defendants, further answering, upon information and belief deny that the said Thomas J. Kirkpatrick, prior to the 17th day of March, 1885, or at any other time was the original and first inventor of certain improvements in bicycle saddles, as alleged in said bill, or any material or substantial part thereof, and deny that said pretended invention or inventions had not been in public use and on sale in the United States for more than two years prior to the time of his application for letters patent therefor

21 in the United States, with his consent and allowance, and deny that said alleged invention of said letters patent was new and useful.

Ninth. That these defendants, further answering, on information and belief answer and say:

1. That the alleged invention or discovery described and claimed in said letters patent No. 314,142 was not and is not an invention or discovery or the proper subject-matter of letters patent of the United States, and that the same was and is the result of mere mechanical skill and judgment.

2. That the alleged invention or discovery described and claimed in said letters patent No. 314,142, or a substantial part or substantial parts thereof, had been, prior to the alleged invention or discovery thereof by the said Thomas J. Kirkpatrick, described and shown

in the specifications and drawings and patented in the following letters patent:

Letters patent to L. Schmetzer, dated January 30, 1883, No. 271,524 for velocipedes.

Letters patent to C. H. Harris, dated May 25, 1875, No. 163,769, for spring saddles.

Letters patent to Curtis H. Veeder, dated July 19, 1881, No. 244,693, for saddle.

Letters patent to Jacob H. Gibson, assignor to Peck & Baker, dated June 2, 1874, No. 151,660, for velocipede.

Letters patent to John Shire, dated June 3, 1879, No. 216,231, for velocipedes.

Letters patent to Curtis H. Veeder, dated January 10, 1882, No. 252,280, for seat for bicycles.

Letters patent to Franklin G. Burley, dated February 14, 1882, No. 253,504, for saddle for bicycle.

Letters patent to Curtis H. Veeder, dated April 5, 1881, No. 239,629, for saddle.

22 Letters patent to Thos. J. Kirkpatrick, dated May 29, 1883, No. 278,560, for bicycle saddle.

Letters patent to Freeman Lillibridge, dated May 4, 1884, No. 294,645, for saddle for bicycles.

Letters patent to Charles E. Duryea, assignor to Richard Garvey, dated February 19, 1884, for bicycle saddle.

Letters patent to Samuel S. Spurgin, dated March 26, 1867, No. 63322, for riding saddle.

Letters patent to Robert Smith, dated August 28, 1849, for spring-seat saddles, No. 6682.

Letters patent to Palmer & Beards, dated June 12, 1835, for spring-seat riding saddle.

Letters patent to Francis Fowler, No. 248,441, dated October 18, 1881, for tricycle.

Letters patent to Francis Fowler, No. 227,511, dated May 11, 1880, for tricycle.

Letters patent to John Curry, No. 63864, dated April 16, 1867, for improvements in saddles.

Letters patent to J. C. F. Solomon, No. 8536, dated November 18, 1851, for riding saddle.

Letters patent to John C. Miller, No. 53854, dated April 10, 1866, for improved spring saddle.

Letters patent to William S. Kelly, No. 321,932, dated July 7, 1885, for bicycle.

Letters patent to Geo. F. Schmidt, No. 115,772, dated June 6, 1871, for improvement in riding saddles.

Letters patent to Thos. J. Kirkpatrick, No. 289,272, dated November 27, 1883, for bicycle saddle.

Letters patent to W. S. Kelly, No. 304,827, dated September 9, 1884, for bicycle saddle.

Letters patent to M. Nelson, No. 27824, dated April 10, 1860, for riding saddle.

23 British letters patent No. 5268 of 1879.

British letters patent No. 1169 of 1881.
British letters patent No. 753 of 1881.
British letters patent No. 3934 of 1879.
British letters patent to Lamplugh & Brown, No. 2751 of 1878.
British letters patent No. 4321 of 1818.
British letters patent No. 3849 of 1879.
British letters patent No. 1647 of 1879.

Tenth. These defendants, further answering, answer and say that the alleged invention or improvement of the said Thomas J. Kirkpatrick and purporting to be claimed in said letters patent No. 314,142, or material and substantial parts thereof, were fully described and shown in printed publications prior to any alleged invention by the said Kirkpatrick, viz., in the printed copies of the specifications and drawings of each of the above English letters patent, printed in London, England, by George Edward Eyre and William Spottiswoode, printers to the Queen's most excellent majesty, and published in the years of their respective dates, and were and have been accessible to the public in the United States in various public libraries in the United States, and particularly in the public library in Boston, Massachusetts, on or about the respective dates of said publications.

Eleventh. That these defendants, further answering, upon information and belief deny that the said Thomas J. Kirkpatrick was the original and first inventor or discoverer of any material or substantial part of the alleged invention or discovery described and claimed in said letters patent No. 314,142, but, to the contrary, aver and charge that the same or substantial parts thereof had been
24 known and used in this country before the date of the alleged invention or discovery thereof by the said Thomas J. Kirkpatrick to and by the following-named parties and at the following-named places:

George W. Marble, of Chicago, in the State of Illinois, at said Chicago.

Charles E. Duryea, of St. Louis, in the State of Missouri, at said St. Louis.

Thomas B. Jeffery, of Chicago, in the State of Illinois, at said Chicago.

Charles H. Harris, of Cedartown, in the State of Georgia, at said Cedartown.

A. S. Harris, of said Cedartown, in the State aforesaid, at said Cedartown.

William S. Kelly, of Smithville, in the State of New Jersey, at said Smithville.

Twelfth. That these defendants, further answering, upon information and belief answer and say that the alleged inventions described and pretended to be claimed in said letters patent to John Shire and Thomas J. Kirkpatrick, numbered 216,231 and 314,142, were patented, known, and used and in public use and on sale by others and at other places than those above cited prior to the alleged invention and discovery by the said Shire and Kirkpatrick and prior to their original application for said letters patent; that they have been

diligent in their efforts to ascertain their names and residences and where used and patented, and they therefore pray leave of this honorable court, on obtaining such information, to file their amended answer setting forth the same.

Thirteenth. That these defendants, further answering, state that they are not sufficiently informed whether said letters patent numbered respectively 216,231 and 314,142 were duly issued to
25 the said John Shire and Thomas J. Kirkpatrick and were duly assigned to the complainant, as alleged, and therefore deny the same, and further deny that the grant of said letters patent to said Shire and Kirkpatrick was according to and in conformity with law, and deny that any alleged assignments of the same by the said Shire and Kirkpatrick professing to transfer and assign said inventions and said letters patent were made to said complainant and duly recorded in the Patent Office of the United States, as alleged in said bill of complaint, and leave the complainant to make such proof thereof as it may be advised.

Fourteenth. That these defendants, further answering, upon information and belief deny that the said inventions pretended to be described and claimed in said letters patent Nos. 216,231 and 314,142 are of great value or importance or are of any value or importance, and further deny that the said alleged inventions have been in extensive use or demand throughout the United States or any parts thereof, and deny that full and exclusive use of said alleged inventions within the United States and territories thereof is in said complainant, and deny that complainant in this suit has made or is making any profit from bringing said alleged inventions into public use.

Fifteenth. That these defendants, further answering, upon information and belief state and charge that the alleged inventions described and pretended to be claimed in said letters patent numbered 216,231 and 314,142 were in public use in the United States more than two years before the alleged patentees thereof made any applications for United States letters patent thereunder.

Sixteenth. That these defendants, further answering, deny that they or either of them have ever infringed any of the com-
26 plainant's lawful rights in the premises as to said letters patent numbered respectively 216,231 and 314,142 or any of the claims thereof, as in said bill alleged, or that they have unlawfully and wrongfully and in defiance of any supposed rights of the complainant made, constructed, used, or sold any machines or devices called velocipedes and bicycles, saddles and seats for bicycles and other velocipedes, embodying the inventions patented as aforesaid or material or substantial parts thereof, as in said bill of complaint alleged, or that they have ever made, constructed, used, or sold any velocipedes and bicycles or saddles and seats for bicycles and other velocipedes embodying the alleged inventions of said letters patent, as in said bill alleged, or that they have used or are now using any machines and devices called velocipedes and bicycles and seats or saddles for bicycles or velocipedes to the mechanism of which or combination of which the said complainant can lawfully

hold the exclusive right under and by virtue of the letters patent referred to in said complainant's bill of complaint.

Seventeenth. That these defendants, further answering, upon information and belief answer and aver:

1. That the specification and drawings annexed to said letters patent numbered respectively 216,231 and 314,142 do not fully, clearly, and sufficiently set forth the claimed inventions so that a person ordinarily skilled in the industry relevant thereto can understand and construct the same.

2. That the said complainant and the parties professing to hold the title antecedent to said complainant in said letters patent numbered 216,231 and 314,142 have not stamped or marked or indicated upon the devices manufactured and sold by them, pro-
27 fessing to represent the alleged inventions of said patents, the numbers, dates, or any indications of said patents, as required by law.

Eighteenth. And that these defendants, further answering, upon information and belief deny that said complainant is entitled to the exclusive control of the several letters patent mentioned in said bill of complaint and of the alleged inventions pretended to be covered thereby, or that the said complainant would have been in full and undisturbed possession of the same if it had not been for the acts of these defendants. These defendants, further answering, upon information and belief deny that the said complainant, as in said bill alleged, has ever enjoyed or been in the exclusive possession of the alleged improvements pretended to be described in said letters patent upon which this suit is brought, or that said alleged inventions have been introduced into public use or have proved of any value whatsoever to the public; also further deny that the public generally or at all have acknowledged or acquiesced in the validity of said letters patent, as alleged in said bill of complaint.

Nineteenth. That these defendants, further answering, deny that said complainant has any right to damages to the amount of $20,000, as in said bill alleged, or to any damages, profits, or gains, or to an account for any damages, profits, or gains, as alleged in said bill of complaint, or to any "previous royalties," as in said bill of complaint alleged; also further deny that the said complainant will be subject to great and irreparable damage unless this court shall grant the relief herein prayed for, or that said complainant will suffer any damage of any description by reason of any of the acts of these defendants, and further deny that the said complain-
28 ant has any right to an injunction against these defendants or either of them.

Twentieth. And these defendants pray the same advantage of their aforesaid answer as if they had pleaded the several matters and things aforesaid to the bill of complaint material or necessary to make answer unto, and if there is any other matter, cause, or thing in said bill of complaint necessary for these defendants to make answer to and not herein well and sufficiently answered, confessed, traversed, or denied these defendants say the same is not true to their knowledge and belief; all of which matters and things

these defendants are ready and willing to aver, maintain, and prove as this honorable court shall direct, and these defendants humbly pray to be hence dismissed with their reasonable costs and charges in this behalf most wrongfully sustained.

GORMULLY & JEFFERY MANUFACTURING CO.,
R. PHILIP GORMULLY,
THOMAS B. JEFFERY,
By OFFIELD & TOWLE, *Their Solicitors.*

OFFIELD & TOWLE,
Solicitors for Defendants.
B. F. THURSTON, *Of Counsel.*

Endorsed: Filed June 6, 1887. Wm. H. Bradley, clerk.

29 Afterwards, to wit, on the fifth day of July, 1887, came the complainant, by its solicitors, and filed in said clerk's office its replication to the answer of the defendants in said entitled cause; which said replication is in the words and figures following, to wit:

Replication.

United States Circuit Court, Northern District of Illinois.

THE POPE MANUFACTURING COMPANY
vs.
GORMULLY & JEFFERY M'F'G COMPANY, R. PHILIP GORMULLY, & THOMAS B. JEFFERY. } In Equity.

The replication of The Pope Manufacturing Company, complainant, to the several answers of Gormully & Jeffery Manufacturing Company, R. Philip Gormully, & Thomas B. Jeffery, defendants.

This repliant, saving and reserving to itself all and all manner of advantage of exception which can or may be had and taken to the manifold errors, uncertainties, and insufficiencies of the answers of the said defendants, for replication thereunto says that it does
30 and will aver, maintain, and prove its said bill to be true, certain, and sufficient in law to be answered unto by the said defendants, and that the answers of the said defendants are very uncertain, evasive, and insufficient in law to be replied unto by this repliant; without this, that any other matter or thing in the said answer contained material or effectual in law to be replied unto and not herein and hereby well and sufficiently replied unto, confessed and avoided, traversed or denied, is true.

All of which matters and things this repliant is ready to aver,

maintain, and prove as this honorable court shall direct, and humbly pray- as in and by its said bill it has already prayed.

Chicago, June 13th, 1887.

THE POPE MANUFACTURING COMPANY,
By COBURN & THACHER, *Solicitors.*

Endorsed: Filed July 5, 1887. Wm. H. Bradley, clerk.

31 Afterwards, to wit, on the twenty-sixth day of January, 1888, in the December term of said court, 1887, in the record of the proceedings thereof in said entitled cause, before Hon. Walter Q. Gresham, circuit judge, and Hon. Henry W. Blodgett, district judge, is the following entry, to wit:

Order.

POPE MANUFACTURING COMPANY
vs.
GORMULLY AND JEFFERY MANUFACTURING COMPANY *et al.* } In Chancery.

Now come the parties, by their solicitors, and this cause, being set for hearing this day, now comes on to be heard upon pleadings and proofs, and after hearing the arguments of counsel in part further hearing herein is hereby postponed until to-morrow morning.

32 Afterwards, to wit, on the twenty-seventh day of January, 1888, in the December term of said court, 1887, in the record of the proceedings thereof in said entitled cause, before Hon. Walter Q. Gresham, circuit judge, and Hon. Henry W. Blodgett, district judge, is the following entry, to wit:

Order.

POPE MANUFACTURING COMPANY
vs.
GORMULLY AND JEFFERY MANUFACTURING COMPANY *et al.* } In Chancery.

Now again come the parties, by their solicitors, and this cause again comes on to be heard upon pleadings and proofs, and after hearing additional arguments of counsel further hearing herein is postponed until to-morrow morning.

33 Afterwards, to wit, on the twenty-eighth day of January, 1888, in the December term of said court, 1887, in the record of the proceedings thereof in said entitled cause, before Hon. Walter Q. Gresham, circuit judge, and Hon. Henry W. Blodgett, dist. judge, is the following entry, to wit:

Order.

POPE MANUFACTURING COMPANY
vs.
GORMULLY AND JEFFERY MANUFACTURING COMPANY *et al.* } In Chancery.

Now again come the parties, by their solicitors, and this cause again comes on to be heard upon pleadings and proofs, and after hearing additional arguments of counsel further hearing herein is postponed until Monday morning next.

34 Afterwards, to wit, on the thirtieth day of January, 1888, in the December term of said court, 1887, in the record of the proceedings thereof in said entitled cause, before Hon. Walter Q. Gresham, circuit judge, and Hon. Henry W. Blodgett, district judge, is the following entry, to wit:

Order.

POPE MANUFACTURING COMPANY
vs.
GORMULLY AND JEFFERY MANUFACTURING COMPANY *et al.* } In Chancery.

Now again come the parties, by their solicitors, and this cause again comes on to be heard upon pleadings and proofs, and after hearing the concluding arguments of counsel the court takes the same under advisement.

Afterwards, to wit, on the thirtieth day of April, 1888, there was filed in said clerk's office the opinion of the court in said entitled cause; which said opinion is in the words and figures following, to wit:

35 *Opinion.*

POPE MANUFACTURING COMPANY
vs.
GORMULLY AND JEFFREY MANUFACTURING COMPANY, R. Philip Gormully, and Thomas B. Jeffrey. } 20544. No. 845.

Before Gresham, C. J., and Blodgett, D. J.

BLODGETT, *J.:*

The bill in this case charges the infringement by defendant of two letters patent owned by the complainant corporation, one being

patent No. 216,371, granted to John Shire, June 3, 1879, for "an improvement in velocipedes," and the other being patent No. 314,142, granted March 17, 1885, to thomas B. Kirkpatrick, for a bicycle saddle. The Shire patent shows a hammock-seated saddle, the seat of the saddle being suspended at each end and fastened at the rear to what is termed a hammock block, which block is fastened to what the patentee calls a "fender," a part which, to some extent, takes the place in his structure of the backbone or reach of the ordinary velocipede, while the forward end of the saddle is fastened by a strap and buckle to a spring bar connected with the bifurcated *streeing*-head. The patent contains four claims, and infringement is only charged as to the second claim, which is:

36 "2. In a velocipede the adjust*i*ble hammock seat I, substantially as set forth."

The element of adjust*i*bility seems in this device to be obtained by means of the strap and buckle by which the hammock seat is fastened at its forward end. The Kirkpatrick patent is said in the specification to consist "in a peculiar arrangement of front and rear springs, secured independently to the reach or backbone of the machine in connection with the flexible seat, suspended at the front and rear from said springs," and defendant is charged with infringement of the first claim, there being six claims in the patent, which is in the following words:

"1. The combination with the perch or backbone of a velocipede or similar vehicle of independent front and rear springs, secured to such perch or backbone, and flexible seat suspended directly over said spring- at the front and rear respectively, substantially as set forth." The defenses made are—

1. Want of title in the complainant to the Shire patent.
2. That both are void for want of novelty.
3. That the defendants do not infringe.

Complainants hold the Shire patent by virtue of an assignment from the patenteee, John Shire, which is in the following words:

"Be it known that I, John Shire, of Detroit, Wayne county, Michigan, for and in consideration of one dollar and other valuable consideration to me paid, do hereby sell and assign to Thomas J. Kirkpatrick, of Springfield, Clarke county, Ohio, all my right, title, and interest in and to the letters patent on velocipedes granted to me June 16, 1879, and numbered 216,331, including all rights

37 for past infringements, so far as said patent relates to or covers adjust*i*ble hammock seats or saddles, except the right to use said seat or saddle in the velocipedes made by me under said patent in my business in Detroit," and by an assignment from Kirkpatrick to the complainant.

It is objected that this assignment did not vest the title in Kirkpatrick, and, therefore, that complainant did not take from him any right except the right to use one claim of the patent, and that therefore this is not such an assignment of the patent as makes the complainant the owner and entitles it to bring suit for infring ement.

Defendants cite no case expressly in point which covers the case here made, but rely upon McClurg *vs.* Kingsland, 1 How., 201; Gaylor *vs.* Wilder, 10 How., 477, and Goodyear *vs.* New Jersey Central Railroad Company, 1 Fish, 626, where the rule is stated that the assignee of a patent cannot maintain a suit for infringement unless he is the owner of the entire patent, either for the whole United States or some specific portion of its territory.

Each claim of the patent standing by itself is a separate patent for the device covered by that claim, and it seems to us that it is entirely competent for a patentee to assign the exclusive right to use so much of the patent as is covered by any one of its claims, and this becomes an operative assignment under the patent laws to transfer the patent covered by that claim. The language of this assignment is broad and comprehensive enough to completely transfer all the rights of the patentee to the hammock-seat feature of his patent, saving to the assignor a mere shop right for the city of Detroit; and hence we think this objection is not well taken.

As to the question of novelty and infringement, it was not
38 new at the time this patent was issued to make a hammock-seated saddle for bicycles nor to make such seat adjustible. Hammock-seated saddles are old and are shown by the proof to have been well know- long prior to the Shire patent, as is shown by Defendants' Exhibit "Bishop," which shows a saddle patent issued in 1859, where there was a leather suspension saddle supported by spring attachments at the end; and while nothing is said about adjustibility it is obvious that if adjustibility were desired it could have been easily secured in this Bishop device without invention. The same may be said of the Miller patent of 1866, the Curry patent of 1867, and the Harris patent of 1875. The proof also shows that Lamplugh and Brown obtained a patent in England in 1878 for a bicycle saddle which was suspended upon springs at each end, and while nothing is said about adjustibility it is plain from the drawings 6 and 7 that it was readily adjustable at the forward end of the Shire patent, figure 6 showing a connection at the forward end by means apparently of an iron strap with an eye-end, which engaged with an iron hook, upon the shank of which was a screw-thread by which this hook could be shortened so as to take up the slack, and even if there was no special adjustibility provided for it is clear that if adjustibility became desirable or necessary it could have been obtained by substituting a leather strap or buckle in place of the iron strap, so as to secure the same kind of adjustibility which is shown in the Shire patent.

It therefore seems to us that so far as the hammock seat was concerned, and making such seat adjustible by means for taking up the slack or even making it moveable upon the reach of the bicycle, it had already been anticipated to such an extent in the art as to make this claim of the Shire patent void, or, if not void, only valid
39 for the special device which was used, and, if valid for the special device, then clearly the defendants' device by which the hammock saddle is suspended at either end does not infringe this second claim of the Shire patent.

The Kirkpatrick patent is described by the patentee in his specification as an invention which "relates to that class of bicycle saddles in which a flexible seat is suspended directly over the saddle spring or springs without the use of an intermediate saddle frame or tree; and my invention consists of a peculiar arrangement of front and rear springs, secured independently to the reach or backbone of the machine in connection with the flexible seat suspended to the front and rear of said springs."

As has already been said in regard to the Shire patent, it was not new at the date of the patent now under consideration to suspend the flexible seat of a velocipede or a bicycle saddle from springs or fastenings at each end.

In other words, hammock seats, as they are called, were old, and the idea of suspending such seats was shown in the Veeder patent of 1882, the Shire patent of 1879, and the Lamplugh & Brown English patent of 1878; and even if those patents did not show a suspension from springs at each end of the saddle and hammock it is clearly and certainly shown in the Folwer patent of 1881, where a saddle seat is shown suspended from springs at each end.

It may be that this Kirkpatrick patent can be sustained as a special device for the bifurcated forward springs which are carried beyond the steering head, and thereby the seat of the saddle is brought somewhat farther ahead than is shown in saddles that are fastened to springs abaft the steering head or post, but the
40 defendants do not use that form of bifurcated springs, and if the patent can be sustained it must be for that special device and nothing else. Hence we conclude that while it is possible that this first claim of the patent may not be absolutely void for want of novelty, yet it does not cover the saddles used by the defendant, nor the manner in which they mount their saddles upon springs. We are, therefore, of opinion that this suit should be dismissed for want of equity.

(Endorsed:) Filed April 30, 1888. Wm. H. Bradley, clerk.

41 On the same day, to wit, on the thirtieth day of April, in the adjourned March term of said court, 1888, in the record of the proceedings thereof in said entitled cause, before Hon. Henry W. Blodgett, district judge, is the following entry, to wit:

Decree.

THE POPE MANUFACTURING COMPANY
vs.
THE GORMULLY AND JEFFERY MANUFACTURING COMPANY *et al.* } In Chancery.

Now come the parties, by their solicitors, and, the court having considered the matters heretofore submitted herein, it is ordered that

said complainant's bill be dismissed for want of equity at complainant's costs, and that execution issue therefor. Complainant's solicitor prays an appeal herefrom to the Supreme Court of the United States, which is allowed on complainant's giving bond in the penal sum of five hundred dollars, conditioned according to law.

42 Afterwards, to wit, on the twenty-seventh day of June, 1888, there was filed in said clerk's office an appeal bond in said entitled cause; which said appeal bond is in the words and figures following, to wit:

Appeal Bond.

United States Circuit Court, Northern District of Illinois.

THE POPE MANUFACTURING COMPANY
vs.
GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, and THOMAS B. JEFFERY. } In Equity.

Know all men by these presents that we, the Pope Manufacturing Company, a corporation duly established by law and having its principal business office at Boston, in the State of Massachusetts, principal, and Harry D. Hollister, of Chicago, in the county of Cook and State of Illinois, as surety, are held and firmly bound unto the Gormully & Jeffery Manufacturing Company, a corporation duly established by law and having its principal business office in
43 Chicago, in said county; R. Philip Gormully, and Thomas B. Jeffery, both of said Chicago, in the penal sum of five hundred dollars, lawful money of the United States; for the payment of which, well and truly made, we hereby bind ourselves and each of ourselves, our successors and assigns, jointly, severally, and firmly by these presents.

In witness whereof the Pope Manufacturing Company has hereunto set its corporate seal and signature, by its president, and the said Harry D. Hollister has affixed his hand and seal this 15th day of June, A. D. 1888.

The condition of this obligation is such that whereas the above-named bounden The Pope Manufacturing Company has been allowed an appeal to the Supreme Court of the United States from the decree of the circuit court of the United States for the northern district of Illinois rendered by said court in the above-entitled cause in favor of the said Gormully & Jeffery Manufacturing Company, R. Philip Gormully, and Thomas B. Jeffery and against the Pope Manufacturing Company and entered of record therein April 30th, 1888, dismissing the bill for want of equity:

Now, therefore, if the Pope Manufacturing Company afore-
44 said shall prosecute its said appeal to effect and shall answer

all damages and costs in case it shall fail to make good its plea, then this obligation shall be void; otherwise to be and remain in full force and effect.

[Corporation Seal.]

THE POPE M'F'G CO.,
By ALBERT A. POPE, *President.*
HARRY D. HOLLISTER. [SEAL.]

Approved.
H. W. BLODGETT, *Judge.*

Endorsed: Filed June 27, 1888. Wm. H. Bradley, clerk.

45 United States Circuit Court, Northern District of Illinois.

Gen. No., 20406. Term No., 824.

THE POPE MANUFACTURING COMPANY
vs.
R. PHILIP GORMULLY. } In Equity.

Met at the office of the Pope Manufacturing Company, No. 79 Franklin street, Boston, Massachusetts, at 10 o'clock a. m., on Tuesday, July 26, A. D. 1887, pursuant to notice hereto annexed; whereupon the following proceedings were had before me, Lewis G. Farmer, a notary public duly authorized to take depositions.

Present: L. L. Coburn, of the firm of Coburn & Thacher, solicitors for the complainant, and Charles K. Offield, of the firm of Offield & Towle, solicitors for the defendant.

It is stipulated by and between the parties hereto that printed Patent Office copies of the specifications and drawings of the letters patent may be introduced and used as evidence in this case the same as original copies of patents or certified copies, duly certified by the Commissioner of Patents; also that the testimony may be taken before any notary public authorized to take testimony in the county in which said testimony is taken.

46 Counsel for complainant offers in evidence two contracts entered into between the parties hereto June 13, 1883, and the same are marked "Complainant's Contract Exhibit No. 1" and "No. 2" respectively; also contract entered into between the parties hereto December 1, 1884, and the same is marked "Complainant's Contract Exhibit No. 3;" also memorandum of agreement entered into between the parties hereto November 28, 1885, and the same is marked "Complainant's Memorandum Agreement No. 4."

Defendant's counsel object to each of the above four exhibits: first, because each and every one of them are incompetent, irrelevant, and immaterial; second, because it appears from the face of each of said agreements that they had expired in all their terms and conditions prior to the filing of the bill of complaint herein; third, because exhibits Nos. 1, 2, and 3 are void upon their face, as being against public policy and in restraint of trade; fourth, generally because said three first exhibits, from their terms and conditions, should have no standing or enforcement in a court of equity; and, fifth, because said exhibits are not proven and because of the erasures and interlineations therein.

CHARLES E PRATT, being produced as a witness to testify on behalf of complainant, first being duly sworn, testified, in answer to interrogatories asked him by the respective counsel, as follows, to wit:

Q. 1. What is your name, age, residence, and occupation?

A. Charles E. Pratt; forty-two years of age; Boston, Massachusetts; attorney and counsellor.

Q. 2. Are you acquainted with the parties to this suit; if so, how long have you known the defendant?

47 A. I am; I have known the defendant, R. Philip Gormully, something over four years, I believe.

Q. 3. Please state the circumstances of your making his acquaintance, and what you know in referance to his relations with the Pope Manufacturing Company, so far as the manufacture of bicycles and tricycles under agreement and contract between the parties is concerned.

Objected to as wholly irrelevant and entirely incompetent if intended in any manner to contradict or explain any written instrument offered in evidence in this case.

A. I was attorney for The Pope Manufacturing Company, complainant, and as such was employed in connection with their transactions with licensees and infringers under patents which they owned relating to bicycles and other velocipedes, and it was in connection with their business relating to these matters that I became acquainted with the defendant Gormully. Mr. Gormully had become connected in business, as I was informed by him, in the way of purchaser and employer in a small bicycle business which Mr. Jeffery had been carrying on under license from the Pope Manufacturing Company and with whom the Pope Manufacturing Company was in litigation respecting some machines made outside of the license; and Mr. Gormully proposed to carry on a bicycle business, and in the negotiations between him and the Pope Manufacturing Company for licenses under patents I represented and acted for the company and concluded the licenses and contracts of 1883 with him. Those are the circumstances under which I became acquainted with him, and I have been familiar with the relations between him and the company ever since.

48 Q. 4. Was the Pope Manufacturing Company manufacturing and selling bicycles and other velocipedes at that time; if so, how extensively, and what grade or class of machines, and how did the machines which Gormully was licensed to make compare with those made by the complainant corporation?

A. The Pope Manufacturing Company was manu-turing bicycles, and had been since the spring of 1878, of several grades or classes, but more particularly of the highest or first grade and second grade of sizes and styles for men's use. They had also previously made quite largely for youths' use smaller sizes. They were the largest and principal manufacturers and dealers in the country, and they had agencies established extensively across the country. They had a number of licensees who were dealers in imported machines of the higher grades, and some licensees under their patents who were makers, including the Western Toy Company of Chicago, to whom they had reserved the making and selling of a class of machines known as boys' bicycles, with rubber tires, of forty-two-inch size and below. This lowest class of machine the Pope Manufacturing Company did not make. The first contract between the Pope Manufacturing Company and Mr. Gormully related to a lim-

ited number of machines which would come within this lowest class. The second contract with Mr. Gormully related to machines of a class next above this lower class and between it and the first and second grade machines for men's use particularly, made by the Pope Manufacturing Company. In this second contract the size of the machines was limited, as well as or in connection with the class, and the third contract was for an extension of the manufacture of that class to the larger sizes. The first-class machines made
49 by the Pope Manufacturing Company were called "Special" and "Expert" Columbia bicycles, and the second grade were called "Standard" Columbia bicycles. These were all made of the larger sizes, although the lower sizes of each of these kinds were small enough for youths' use and were of similar sizes with some of those made by Mr. Gormully. The machines which Mr. Gormully was licensed to make and which he and his firm did make and sell were more particularly youths' machines and of an intermediate grade and class of material, construction, finish, and price and, in a general way, of sizes between the lowest class, made by the Western Toy Company and the "Standard" Columbia grade, made by the Pope Manufacturing Company.

Q. 5. Has the Pope Manufacturing Company ever consented to the revocation of the 6th, 7th, 8th, 9th, and 11th sections of the contract No. 3, which by the terms of said contract "are irrevocable except by written consent of the party of the first part"?

A. No; it has not.

Q. 6. Are those clauses of said contract still in force and binding upon the parties thereto?

Objected to as incompetent and as being without the province of this witness to construe, alter, or change in any manner the written instrument referred to.

A. They are, as I and the company have always understood it.

Q. 7. What were the machines that were named in section 8 of that contract No. 3, and what features, if any, distinguished a high-grade machine such as were being manufactured by the complainant corporation?

50 A. The "Ideal" bicycle referred to in that section was the best machine made by Mr. Gormully (he also made another style known as the "Challenge"), and the "Standard" Columbia bicycle and the "Expert" Columbia bicycle were machines made by the Pope Manufacturing Company. The "Columbia" and "Victor" tricycles were machines made respectively by the Pope Manufacturing Company and the Overman Wheel Company. The "Æolus" ball pedals referred to were a well-known description of pedal in the market, of English make, I think, entirely at that time, but in use on the "Victor" machines made by the Overman Wheel Company at that time and on some of the machines sold by the licensed importing dealers. I think at that time, too, the Pope Manufacturing Company was supplying these pedals for use on its own machines; they had dealt in them more or less.

Besides a more expensive and finer material, workmanship, and

finish the high-grade machines of that time were constructed with hollow, tubular forks, ball bearings, nickel or enameled finish, and more specialties of construction, such as laced or tangent spokes, hollow fellies, hollow handle bars, Moran handles, tubular or semi-tubular rear forks, and usually more complex structure of saddles and springs and so forth; some or all of them. The presence of ball bearings to both wheels and pedals or even to the wheels only would alone indicate a high grade of machine, and any two or three of the other things named would tend to indicate a high grade of machine, since any of these different things which I have indicated were generally limited to the high-grade machines.

Q. 8. It is provided near the close of section 9 of agree-
51 ment No. 3 that the defendant will not make any of the devices named in that section or any other device or invention secured by either of these patents other than according to the permission, conditions, and description in paragraph numbered "first" in this agreement or as otherwise agreed in writing with the party of the first part. Is there any writing or agreement between the parties other than as provided in paragraph numbered "first" in this agreement, giving to the defendant or those associated with him any right to manufacture the parts named in said section; if so, when was said writing or agreement made?

A. There is none, except the previous two contracts of license which I have referred to and which are in evidence, numbered 1 and 2.

Q. 9. If the defendant and his associates in business have surrendered his or their rights to manufacture bicycles or other velocipedes under and by virtue of paragraph numbered "first" of agreement No. 3, or under agreements No. 1 or No. 2, referred to in your last answer, and ceased to pay royalties to the Pope Manufacturing Company, have they now any right or did they have any right to manufacture bicycles, tricycles, or Æolus ball pedals with any of the features named in sections 8 and 9 in said contract No. 3?

A. No; they have no right to manufacture tricycles or Æolus ball pedals at all, or bicycles, except of the description named in license contracts Nos. 1 and 2, using any of these specific devices referred to, because they have no license or permission and because they agreed they wouldn't, and the company has at all times insisted upon their observing that agreement.

Q. 10. What did the defendant Gormully do with reference to violating the terms of the agreement or agreements entered
52 into and with reference to associating with him others in such manufacture, or changing the name or style under which he manufactured, if anything?

A. He proposed and urged to the Pope Manufacturing Company that he should have a license or licenses to make machines of the description he is now making for his firm of Gormully & Jeffery, preferring to have the new license still in his individual name, as he had before. He visited the company in Boston, after being notified of infringement and of violation of contracts, for the purpose of negotiating such further license. No license was negotiated and

executed, however, and Mr. Gormully was given to understand that the Pope Manufacturing Company would insist upon its contracts and its patents, and would commence suits against him and his firm. Some time after the company received notice that the business of Gormully & Jeffery would in future be carried on by the Gormully & Jeffery Manufacturing Company. Mr. Gormully and his associate, Mr. Jeffery, continued to violate the terms of the agreements, both before and after this change of name. The shops and places of business being the same, the machines made being the same, with one or two additions or variations, the business being carried on just the same, and, so far as I know, he did not associate with him in the business any others than those who were associated with him before, though there was one other member of the Gormully and Jeffery Manufacturing Company besides Mr. Gormully and Mr. Jeffery about whom I do not know, whether he was in the business with them before or not, nor could I find out. The dealings of the Pope Manufacturing Company with the Gormully & Jeffery Manufacturing Company in matters of merchandise, both before and since the notice of change of name, only indicate that it is the same concern continued.

53 Q. 11. Have you any machines made by Gormully or his associates in violation of the agreements offered in evidence and containing the features named in sections 8 and 9 of agreement No. 3, or which infringe the patents named in said agreement that were specially stipulated therein as valid; if so, will you produce the same, giving the names, so far as you can, under which said machines are sold by defendant?

A. I have and produce an American "Champion" bicycle, fifty-two inch size, made by Gormully & Jeffery and sold, I believe, by the Gormully & Jeffery Manufacturing Company. I have also and produce a fifty-two inch American "Light Champion" bicycle, made and sold, I believe, by the Gormully & Jeffery Manufacturing Company. I have also and produce a thirty-four inch "Ideal" tricycle, made by the same concern.

Adjournment at 1 p. m. to 2 p. m.

Met at 2.15 p. m. and adjourned, by consent of counsel, until Wednesday, July 27, at 10 a. m.

Resumed Wednesday, July 27, 10.15 a. m., pursuant to adjournment.

Parties present as before.

Counsel for complainant offers in evidence the machines referred to in the last answer, viz., the American Champion bicycle and the same is marked "Complainant's Exhibit Defendant's American Bicycle"; also the American Light Champion bicycle and the same is marked "Complainant's Exhibit Defendant's American Light Champion Bicycle"; also the Ideal tricycle and the same is marked "Complainant's Exhibit Defendant's Ideal Tricycle."

54 Q. 12. Please point out to the court what features or mechanisms named in sections 8 and 9 of the license agree-

ment No. 3 as features which the defendant agrees not to manufacture other than according to the permission in paragraph numbered "first" of this agreement and which he now manufactures in violation of said agreement are contained in said exhibits, and also point out the patents owned by the complainant company covering such features or mechanisms.

The assumption of this question is objected to as not being founded upon any fact appearing in this record.

A. I find in Exhibit Defendant's American Champion Bicycle features referred to in section 9th, as follows:

1. "(*a*) Backbone bifurcated for a rear wheel."
2. "(*c*.) Bearings containing balls or rollers and latterly adjustable."
3. "(*d*.) Brake combined with the handle bars and front wheel."
4. "(*e*.) Cranks adjustable to different length of throw."
5. "(*f*.) Forks of tubular construction."
6. "(*h*.) Pedals that are polygonal," and so forth.
7. "(*i*.) Round contractile rubber tires in grooved rims," etc.
8. "(*j*.) Saddle adjustable fore and aft."
9. "(*k*.) Saddle having a flexible seat and means of taking up the slack."
10. "(*l*.) Stearing head, * * * cylindrical, with stop from complete turning."
11. "(*m*.) Leg-guard over front wheel."
12. "(*t*.) Any other device or invention secured by either of these patents." Under this I find that this exhibit contains in the bearings to the front wheel what are known as "Wallace" or "Columbia" bearing devices.

I find in Exhibit "Defendant's American Light Champion Bicycle" just the same things, and also:

13. "(*s*.) Tangent spokes."

I find in Exhibit "Defendant's Ideal Tricycle" features referred to in said section 9, as follows:

14. "(*b*.) Balance gear allowing two wheels abreast differing in speeds or curves," and also polygonal pedals, round contractile rubber tires in grooved rims, saddle adjustable fore and aft, saddle having a flexible seat and means of taking up the slack in similar form to those above referred to as found in the other two exhibits, with the exception that the saddle is constructed differently, and the specific means for taking up the slack of the flexible seat includes a screw.

Of these features especially referred to in section 9, which I have above pointed out and indicated by numerals, the first, second, third, fourth, fifth, sixth, seventh, eighth, tenth, and eleventh are also specifically referred to in the section numbered eight in a little different order of reference. These features so referred to in section eight, against which I set the same numerals as used in the foregoing list, but keep the order of this section, are as follows:

8. "(*a*.) The invention, etc., R. 3297, in the saddles of said bicycles and their connection therewith."

4. "(*b.*) The invention, etc., last-named patent, in the cranks of said bicycles."

1. "(*c.*) The invention, etc., last-named patent, etc., rear forks of bicycles."

11. "(*d.*) The invention, etc., patent 85527, in the leg-guard of said bicycles."

56 3. "(*f.*) The invention, etc., patent 86834, in the brake mechanism of said bicycles and its connections."

10. "(*g.*) The invention, etc., said patent 86834, in the steering head of the said bicycles and its connections."

7. "(*h.*) The invention, etc., patent 87713, in the tires of the wheels of said bicycles."

5. "(*i.*) The invention, etc., patent 88507, in the front forks of said 'Expert.'"

6. "(*j.*) The invention, etc., last-named patent, in the pedals of said bicycles."

14. "(*k.*) The invention, etc., patent 194,980, in the balance gear and its connections in the Columbia and Victor tricycles."

2. "(*l.*) The invention, etc., patent 197,289, in the ball-bearings of said Expert bicycle, etc., and in Æolus ball pedals."

The patents owned by the complainant company covering such mechanisms are those thus pointed out specifically in section numbered 8, viz:

Hanlon reissue 5297, as to saddles adjustable fore and aft and cranks adjustable for different lengths of throw and bifurcated backbones.

The Irwin patent, 35527, as to the leg-guard.

The Wm. Hanlon patent, 86834, as to the brake mechanism and the stop steering head.

The Sorrell patent, 87713, as to the round contractile rubber ti-es.

The Pickering patent, 88507, as to the front forks of tubular construction and the polygonal pedals covered the devices referred to as found in these two bicycle exhibits, and the Sorrell and Pickering patents covered the tire and pedal devices in this tricycle

57 exhibit, but these patents have expired; and the patents 194,980, of Whitehead, as to the balance gear, and 197,289, Peters' patent, as to adjustable ball bearings, cover devices in the tricycle exhibit and the two bicycle exhibits respectively, as above referred to, and these patents are still in force. The other patents owned by the complainant company and covering features as inquired of and which are still in force are the following: The Veeder saddle patent, 52280, in the saddles and connected mechanisms of all three exhibits, and the Wallace bearing patents, 249,277 and 280,421, used in the two bicycle exhibits.

The Moran handle patent, 245,542, referred to in these sections, is also used in Exhibit "American Champion Bicycle" if the third claim of the patent be construed to cover "a rubber handle for a velocipede, consisting of a ball and neck combined in one piece," whether the tang of the handle bar extend entirely through the handle or not. But as the defendant used the Moran handle in its completer form I do not understand that this question is intended

rubber pedals (modified a little to their disadvantage in that the bars do not turn freely on their pins), and so on, even to minor details not patented, but copied.

Like the complainant's "Columbia Light Roadster," the defendant's "Champion Light Roadster" has a lighter general construction than the "roadster," the same similarities of finish in nickel and enamel, in forks, pedals, bearings, saddles, handle bars, etc., and also what are called loosely in the trade "tangent" spokes instead of direct spokes—that is to say, spokes not set in a radial line from hub to rim, headed in the latter and treaded in the former, but set on an angular line between a direct and a tangent and crossing each other and "laced," tied, or fastened at the intersections, "laced" spoke wheels being rather established as features of light roadsters.

Similar similarities are observable between these machines of defendants and the high-grade roadsters and light roadster's of complainant's licensees, as, for instance, the "Victor" machines of the Overman Wheel Company, the "Rudge" machines of Stoddard, Lovering & Co., and so on.

In the tricycle exhibit the vertically adjustable handle rods and seat rod are covered by the Overman patent, 257,375, owned by complainant, and these machines, although of lower grade, are made two-track and otherwise, more or less, to imitate complainant's machines.

Adjourned at 1.35 until *to* 2.15 p. m.

62 Resumed at 2.45 p. m.

Q. 15. Have you Patent Office copies of the specifications and drawings of the *l*atters patent that are still in force which are especially named by date and number in the license agreement No. 3 and which you have named in your answer as covering elements or devices which you find in the defendant's machine exhibits? If you have, will you produce the same and point out to the court the devices in said letters patent and the claims in said letters patent in which said devices are made specifically the subject-matter of the claims, and also point out in said defendant's machine exhibits the corresponding devices, and explain in what respect they are like or unlike each other?

Last objection repeated.

A. I have and produce the copies inquired of—

The Whitehead patent, No. 194,980, dated September 11, 1877. This patent shows, in combination with the driving mechanism and the main wheels, a device commonly known as a "balance-gear" device, which, when the vehicle describes a curve, allows the outer wheel to rotate at a higher speed than the inner one without affecting the movement of the foot pedals or other actuating devices. This second clause of claim in this patent is for "an improved velocipede, consisting of driving wheels A B, axles C *c* D *d*, bevel wheels E F, and one or more bevel gears G, which bevel gears are applied to

the master wheel H I *i i'*, substantially as herein described," and the third claim is for, "In combination with master wheel H I *i i'*, having the bevel gear G applied thereto, the wheels K L, and foot pedals *l l'*, substantially as herein described." In the Exhibit "Ideal Tricycle" there is substantially the same construction
63 and parts or their equivalents and the same operation for the same purpose as shown and described in this patent and claimed in these two causes of claim and as referred to in the sections 8 and 9 of agreement No. 3 instead of a toothed wheel intermediate between the wheel on the crank shaft and the master wheel.

For communicating power, as is shown in the patent, the well-known equivalent of an endless driving chain is used in this tricycle exhibit and it was so used in the "Columbia" and "Victor" tricycles referred to in the agreement; and in a similar manner known equivalents are used for several of the other devices named in these claims. In the Exhibit Tricycle the master wheel is not located midway between the driving wheels of the machine, as shown in this patent, but is located at the side of the machine, adjacent to one of the driving wheels, as it was in the "Victor" tricycle referred to. The Exhibit Tricycle has not bevel wheels, as shown in this patent, connected with the master wheel, but has an equivalent arrangement of spur-toothed wheels, and in this respect is also more like the "Victor" tricycle referred to in the agreement. Instead of each driving wheel being fixed to an axle extending inward from it to and within the master wheel near the middle of the machine, as in the patent, this exhibit has a long main axle to which one of the driving wheels is fixed and extending through the other driving wheel, this latter wheel being free to revolve independently of this long main axle, and having attached to it a toothed wheel forming part of the balance-gear devices, and in this respect it is more closely like the Victor tricycle referred to in the agreement.

Copy of Whitehead's patent, No. 194,980, introduced in evidence and marked "Complainant's Exhibit Whitehead Patent."

64 The Peters patent, No. 197,289, dated November 20, 1877, sets forth and claims, in its second clause of claim, "the bearing with the shoulder beveled or notched, combined with the nut or its equivalent, correspondingly beveled or notched, as shown in Fig. 4." I understand this claim to be for the combination, in a bearing, of a series of anti-friction rollers surrounding the axle and and within the hub or box, beveled or cone surfaces in the hub or box, and beveled or cone surfaces on the axle, between and upon which beveled or cone surfaces the anti-friction rollers have their bearing, and one of which beveled or cone surfaces on the axle is adjustable toward and from the other by means of a nut or its equivalent upon and concentric with the axle. This combination of devices, constructed substantially in the same way and operating in substantially the same way, to produce substantially the same result, is found in each of the bearings to the main wheel, rear wheel, and pedals in each of the exhibits, "American Champion" and "American Light Champion;" and it is also found in these

machines constructed in substantially the same manner as it was in the "Expert" bicycle and "Victor" tricycle and "Æolus" ball pedals referred to in said agreement.

Copy of Peters patent, No. 197,289, introduced in evidence and marked "Complainant's Exhibit Peters Patent."

In the Wallace patent, No. 249,278, dated November 8, 1881, is set forth an anti-friction bearing, having spherical rollers instead of cylindrical, as shown in the Peters patent, and certain improvements claimed in the second clause of claim, as follows: "The described anti-friction bearing for a wheel and axle, consisting of a one-part bearing box and a two-part sleeve, having a circular row of
65 balls within said box and between bearing surfaces in the box and on either part of the sleeve and adapted for adjustment for wear and securement in position on an axle by a screw-thread at the outer end of one part of the sleeve operating to draw it toward and from the other part, substantially as set forth;" and in the third clause of claim as follows: "The described anti-friction bearing for a wheel and axle, consisting of a two-part collar or sleeve adapted to inclose the axle, a one-part bearing box, inclosing said sleeve and containing a recess with bearing surfaces, between which and a bearing surface on either part the said sleeve is held a circular row of balls, combined and constructed essentially as shown and described for securement in position and adjustment for wear by the pressure of one part of the sleeve against the hub of the wheel and by an external thread on the other part of the sleeve, operating on an internal thread in the air boss secured to the axle on the opposite side, substantially as set forth." In the front wheel bearings of each of these two exhibits, "American Champion" and "American Light Champion," are found the devices and combinations referred to in these two claims and substantially in the same form in which they were shown in the "Expert Columbia" bicycle referred to in said agreement. In the "Expert" bicycle and in these exhibits, however, the adjustable part of the sleeve instead of being turned with an inserted rod and secured by a set screw is turned by a serrated disc and secured by a dog operating on the disc, and in the exhibit there is this further slight difference between them and the "Expert," that the serrated disc instead of being fast to the movable part of the sleeve is free on it to turn one way and held by a catch from turning the other way.

66 Copy of Wallace patent No. 249,278 introduced in evidence and marked "Complainant's Exhibit Wallace Patent No. 1."

In the Wallace patent No. 280,421, dated July 3, 1883, there is shown and described a bearing containing a circular row of balls, a one-part bearing box, and a two-part sleeve and cone surfaces, one part of the sleeve being adjustable and in which the one-part box instead of being attached directly to the fork end is held in a "shell case having an opening for the axle and sleeve, a lug, 'F,' by which it may be attached to the frame of the vehicle, and with a cavity freely fitting the circumference of the bearing

box." The object of this connection being to allow for variation in the fitting or motion of the frame or fork and bearing box and axle, making substantially a universal joint, and this construction and combination is claimed in the third clause of claim as follows: "The combination in a ball-bearing device of a free bearing box, G, and a shell case, E, substantially as set forth." This combination is found in the two exhibits, "American Champion" and "American Light Champion," in connection with the front forks and bearings constructed substantially the same as it was in the "Columbia" tricycle referred to in said agreement. The unessential difference exists between these exhibits and the devices shown in the patent and in the "Columbia" tricycle that the part in the exhibits corresponding to the "shell case E," which is attached to the fork or frame and fits circumferentially about the one-part bearing box, is in two parts instead of one, as in the patent, one part being hinged to the other at the top side and held to the other at the bottom side by means of a small bolt.

67 Copy of Wallace patent No. 280,421 introduced in evidence and marked "Complainant's Exhibit Wallace Patent No. 2."

In the Moran patent, No. 245,542, dated August 9, 1881, is set forth an improvement in velocipedes consisting in providing them with rubber handles constructed with a ball and neck and held upon the tang of the handle bar without the projection of a screw or nut upon the outside of the handle and for the purpose of counteracting the jar on the hands in traveling and preventing injury to the machine in falling.

The first clause of claim in this patent is for "the handle of a velocipede provided with rubber ends, as set forth," and the third clause of claim is for "a rubber handle for a velocipede consisting of a ball and neck combined in one piece, as set forth."

In the Exhibit "American Ideal" Bicycle are found handles constructed according to these claims and in substantially the same manner as they were constructed and used on the "Expert" and "Standard Columbia" bicycles referred to in the agreement No. 3, with this difference, that in this exhibit the handles are held to the handle bar by the compression of the rubber and, I believe, by cement instead of by screw-threads or by spring catches, as shown in the patent or in the "Expert" and "Standard Columbia bicycles."

Copy of Moran Patent, No. 245,542, introduced in evidence and marked "Complainant's Exhibit Moran Handle Patent."

Adjourned at 5.30 p. m. until 10 a. m. Thursday, July 28th.

68 Met pursuant to adjournment Thursday, July 28, at 10.15 a. m.

Parties present as before.

(Mr. PRATT continued as follows:)

In the Veeder patent, No. 252,280, dated January 10, 1882, the first clause of claim is for "a suspension saddle constructed with a

flexible portion, C, and having an under spring in two or more parts, B D, to which the flexible portion is attached at either end, and which metallic parts are extensible, substantially as and for the purposes set forth." In each of the two machine exhibits, "American Champion" and "American Light Champion," there is a saddle and supporting mechanism constructed substantially as and for the purposes set forth in this claim, the flexible portion of these saddles being of leather attached at either end to one of the two parts of a divided under spring, or, in other words, each end of the flexible portion is attached to one of two independent but co-acting springs, and these two springs or two parts of the under spring are extensible, "so as to take up the slack of the 'flexible seat,'" as expressed in the patent.

(Veeder patent, No. 252,280, introduced in evidence and marked "Complainant's Exhibit Veeder Patent.")

In these exhibits the two parts of the under spring do not meet and lap, as in the form shown in Fig. 1 of the patent, and are not extensible or movable, one from the other, by means of a screw and clamp and stop, as shown in the same figure, but they are extensible in substantially the same way and for the same purpose, one of the parts of the under spring being fixed in its position on the perch or frame and the other part being held by a movable clamp and screws on the frame for that purpose. In the exhibits "American Ideal
69 bicycle" and "Ideal tricycle" the saddles are constructed differently in respect to the under mechanism but still with a flexible portion of leather for the seat piece, supported at either end upon one part of a divided under plate, these two metallic under parts being extensible substantially as and for the same purpose as in the patent and in the other two exhibits, but in these there is also an adjusting bolt with a stop and clamp, substantially as set forth in the patent and claimed in the second clause of claim, which is as follows: "In a velocipede seat, the combination of plates B and D, clamp F, stop b^2, and adjusting bolt F', substantially as shown and described."

Q. 16. Please point out to the court any clauses in said contract No. 3 wherein the said defendant, Gormully, obligated or bound himself or himself and associates not to manufacture the features or devices pointed out by you as being contained in the defendant's exhibit machines; also any language by which it was agreed that these features were covered by these patents or some of them; also explain to the court whether there is any clause in the contract which would enable the defendant to discontinue the payment of royalties under the contract or surrender the license portion of the contract, and by so doing be relieved from all obligations entered into in sections 6, 7, 8, 9, and 11 of said contract.

Last objection repeated, and, further, defendant's counsel objects to any construction or attempted construction being put upon this paper by this witness.

A. This agreement No. 3 contained in the section numbered "first" a license under fifteen of the patents named in the list in

the preamble, so far as applicable to bicycles of a quality, construction, grade, and finish then well understood between the
70 parties and exhibited in the "Challenge" and "Ideal" bicycles, made by the defendant and his firm under the two previous contracts; and whereas the previous contracts limited the sizes of this class of machines to be made to 50-inch, and under this agreement No. 3 extended the license to apply to and enable the defendants to make machines of the same class of the larger sizes, 52-inch and upward, which are the principal men's sizes of bicycles.

In the "second," "third," "fourth," and "fifth" sections were stipulations on the part of the defendants that they should maintain a place of business, keep a stock of the licensed machines, advertise, keep accounts, make returns, pay royalties, and pay at least $1,000 in royalties in each year under this license.

The "sixth" and "seventh" sections of the agreement related to prices, marking the machines, etc., and the "tenth" section related also to prices, discounts, manner of supplying the market, and certain things as to royalties and exported machines.

In the "ninth" section were stipulations that the defendants should not, directly or indirectly, manufacture the features or devices referred to and which the defendant was licensed to make in any other class of machines than that in which he was licensed, and would not manufacture the other devices already pointed out in any machines whatever, except by permission in writing from the complainant.

In the eighth clause certain of these features and devices were pointed out and particularly referred to in connection with certain patents and certain machines, and for greater certainty and to avoid dispute afterwards it was consented and agreed that those devices and inventions were contained in those machines.

71 As to the last part of the question, there is not any clause which would enable the defendant to be relieved from the obligations entered into in sections 6, 7, 8, 9, and 11 of the contract, but there is a clause enabling him to discontinue the payment of royalties and to be released from the requirements of sections 2, 3, 4, and 5, that he should maintain a place of business, keep a stock of these licensed machines, advertise to a certain amount, keep certain accounts, make certain returns in writing, pay certain royalties, and make the royalty account equal to $1,000 a year at least. The provision by which he could be released from these things is found in the eleventh section of the agreement, as follows: "The party of the second part may surrender the license herein contained at any time by written notice to that effect and the returning of this contract to the party of the first part." But it was expressly reserved and agreed that he should not be relieved from the other obligations relating to the class of machines and the devices and inventions he might use, etc., in the same section "eleventh" and immediately after the words already quoted. The words in which this provision just explained is expressed are as follows: "But no such revocation (referring to a provision for revocation by the licensor in certain events) or surrender (referring to the said provision for sur-

render of the license and relief from certain parts of the contract by the licensee) and no termination of this contract or any part of it shall release or discharge the party of the second part from any payment * * * or from the obligations, admissions, and agreements contained in the sections hereof numbered 'sixth,' 'seventh,' 'eighth,' 'ninth,' and 'eleventh' hereof, which are a part of the consideration for the granting of the license herein, and are
72 irrevocable except by written consent of the party of the first part."

Q. 17. Please point out to the court the devices in the letters patent owned by the complainant corporation on which suit has been brought against the defendant Gormully, or Gormully and his associates, for manufacturing the bicycles and tricycle offered in evidence, pointing the claims of which said devices are made the subject-matter, and also compare the devices claimed in the patents with the corresponding devices contained in the machine exhibits, giving their similarities and dissimilarities, confining your answer to such patents as are not specifically named in the license agreement above referred to, and if you have copies of such patents please produce them that they may be offered in evidence.

A. I produce, first, a copy of the Shire patent, No. 216,231, dated June 3, 1879, for improvements in velocipedes. The second clause of the claim in this patent is for "in velocipede, the adjustable hammock seat J, substantially as set forth." The hammock seat set forth in this patent is constructed and combined in the velocipede so as to contain a flexible seat piece extending fore and aft above the frame of the machine and wider at its rear end and narrower at its front end, to serve as a saddle without any tree or under plate, and supported at its rear end by a rigid projection from the frame and at its front end by another metallic attachment to the frame, so that this flexible seat piece is suspended at either end as a hammock is, and substantially free from any rigid parts between the operative middle portion of it and the frame of the velocipede. It has a device or construction for adjusting it and for raising or lowering the middle part of it and for tightening or loosen-
73 ing the slack of the seat, and one end of it—that is, the forward end—is connected with a spring.

In the exhibits "American Champion" and "American Light Champion" the saddle and its supporting mechanism contain an adjustable hammock seat, substantially as set forth in this patent and claim. There is here exhibited a flexible seat piece of leather in place for a saddle, narrower at the front end and wider at the rear end, constructed without tree or under plate, supported at either end by projections from the frame, the front end connected with a spring attached to the frame and with means of adjusting and taking up the slack and raising and lowering the middle or operative seat portion; constructed in substantially the same manner, to operate in the same way and for the same purpose, and accomplishing the same result. In these exhibits the rear end of the seat is also connected with a spring instead of a rigid projection and the means of adjusting and taking up the slack and raising and lowering the

middle portion consist in a device connected with the rear end instead of the front end, and in a sliding clip on the frame instead of a strap and buckle on the seat piece.

(Shire patent, No. 216,231, introduced in evidence and marked "Complainant's Exhibit Shire Patent.")

I next introduce the Kirkpatrick patent, No. 314,142, dated March 17, 1885, which relates to a bicycle saddle of the same general type as the Shire patent and sets forth a saddle or seat mechanism containing a flexible seat piece without tree or under plate, suspended at either end upon springs connected with the frame or perch of the bicycle. The front spring rests upon the top of the perch
74 next to the neck and is secured in position by a bolt or pin passing through the neck of the perch and is bent forward and upward on either side of the neck to connect with and support the front end of the seat piece. The rear spring is held by a movable clip to the frame or perch of the bicycle independently of any connection with the front spring, and is connected at its upper part with the rear end of the seat piece so as to provide a yielding seat for the rider, which, in operation, yields under the weight of the rider in a downward direction at either end or both ends, and by its lesser yielding in other directions makes a more elastic seat. The first clause of claim in this patent is as follows: "The combination with the perch or backbone of a bicycle or similar vehicle of independent front and rear springs secured to said perch or backbone, and a flexible seat suspended directly from said springs at the front and rear, respectively, substantially as set forth."

In these two exhibits, "American Champion" and "American Light Champion," are exhibited exactly the things and the combination of things pointed out in this claim, constructed to operate in the same manner and for the same purposes and accomplishing the same results. In these exhibits the front and rear springs are constructed of round wire rods instead of flat plates, as in the contrivance shown in the patent, and are bent in somewhat different curves.

(Kirkpatrick patent, No. 314,142, introduced in evidence and marked "Complainant's Exhibit Kirkpatrick Patent.")

Adjourned at 1 p. m. until 2 p. m.

Resumed at 2.15 p. m.

75 I take next the Benham patent, No. 310,776, dated January 13, 1885, which sets forth certain improvements, the objects of which are to obtain "a secure and detachable handle bar in one continuous piece, easily and securely fixed in position, whether the bar be solid or hollow, curved or straight," the handle bar in this contrivance being attached to "an enlargement of the steering head A, which constitutes the handle-bar lug and has a horrizontal slot or opening through it at right angles to the vertical axial line of the steering head, which I make of just sufficient breadth to allow of the introduction of the handle bar, or, in other words, of

about the breadth of the diameter of the handle bar, and also with jaws *e e*." The handle bar in this contrivance is secured in the steering head by two sleeve nuts adapted to surround the handle bar, one on either side the steering head, brought up and screwed onto the projection of the handle-bar lug to hold the handle bar in position. The first clause of claim in this patent is for "the combination of an undivided bar and an open-slotted lug and two sleeve nuts or their equivalents, one on either side of the lug surrounding the bar and adapted to lock it rigidly to the lug, essentially as set forth. The combination described in this claim appears in the handle bar and steering head, and the means of screwing them together in each of the two exhibits, "American Champion" and "American Light Champion," in which there is a curved, continuous, hollow, cylindrical handle bar held in an open-slotted handle-bar lug on the front side of the head, projecting on either side, and a split ring or clamp, with a screw on either side, surrounding the bar and the projection of the lug and holding the two together, this difference appearing that in the exhibits, instead of a threaded nut working upon threads upon the projection of the lug, there is a split ring or clamp tightened by a screw on one side, operating as an equivalent for the nut. The third clause of claim in this patent is for, "In combination with the handle bar B, the detents D, constructed and adapted to operate substantially as and for the purposes set forth." In the patent the detent D is shown as a projection on the handle bar engaging in a slot in the steering head, whilst in the exhibits the corresponding parts are found to be a projection in the head engaging in a slot in the handle bar, but operating substantially in the same way for precisely the same purposes, viz., to aid in centering the handle bar in the lug and to prevent it from turning or revolving on its axis.

Benham patent, No. 310,776, introduced in evidence and marked "Complainant's Exhibit Benham Patent."

I next produce the Latta patent, No. 323,162, dated July 28, 1885, for certain improvements in velocipedes, amongst the objects of which relating to the pedals are these.: "To so construct the parts whereby the pedal bars are more elastic and yielding to the foot than those now in use and whereby the bearing surfaces are increased and the weight of the bars reduced at the same time." The second clause of claim in this patent is for "the combination, with the pedal frame, of a rubber pedal bar, H, provided with a central longitudinal groove, *h*, and two bearing surfaces h^1 h^1 on opposite sides of the groove *h*, substantially as set forth."

And the third clause of claim of this patent is for "the combination, with the pedal frame, of a rubber pedal bar, H, pivoted to the frame by a rod, *i*, and provided on each of its sides with a longitudinal groove, *h*, and two bearing faces h^1 h^1 on opposite sides of the groove, whereby the bar H is adapted to receive the pressure at its sides or edges and be compressed on opposite sides of the rod *i*, substantially as set forth."

In each of the exhibits, "American Champion" and "American

Light Champion," the pedals are so constructed as to contain the combinations claimed in these two clauses of claim. In each of them, as in the patent, the rubber pedal bars are polygonal instead of plain cylindrical in form; are pivoted and held in the pedal frame by a rod extending longitudinally through the middle; and each of these rubber bars is longitudinally grooved on its outside faces so as to provide two bearing surfaces on opposite sides of the groove on each bar to receive the sole of the rider's shoe, whereby the bar is adapted to receive the pressure at its sides or edges and be compressed on both sides of the rod, and also whereby the pedal bar is more elastic and the bearing surfaces increased. In the pedals of Exhibit "American Champion" there is but one large longitudinal groove on the outer and inner or non-operative sides of the pedal bars instead of two smaller grooves and a rib between them, as in the pedal of Exhibit "American Light Champion;" and in the pedals of both exhibits there are in the longitudinal groove in each operative side of the pedal bar two little transverse ribs crossing the groove for no apparent purpose except to differ a little in appearance.

(Latta patent, No. 323,162, introduced in evidence and marked "Complainant's Exhibit Latta Patent.")

Adjourned at 3.20 p. m. until 10 a. m., Friday, July 28, 1887.

78 Met Friday, July 28, 1887, at 10.15 a. m., pursuant to adjournment, and adjourned at request of defendants' counsel until 1 p. m.

Resumed at 2.15 p. m.

Parties present as before.

It is hereby stipulated by and between the parties hereto that the title of the patents offered in evidence in this cause or set up in the bill of complaint in any of the six suits pending in the United States circuit court for the northern district of Illinois in which R. Philip Gormully or R. Philip Gormully and others are defendants rests in the complainant corporation, as declared in said bills of complaint, excepting the title of the Shire patent, "Complainant's Exhibit Shire Patent," the assignments of all these patents having been submitted to the counsel for the defendants, and their production in court, as well as their introduction in evidence, is waived, excepting the assignment of said Shire patent; and it is stipulated that copies of the same, which said counsel has compared with the originals, may be introduced and used as evidence the same as the original assignments.

Counsel for complainant offers in evidence a copy of an assignment from John Shire to Thomas J. Kirkpatrick, dated July 10, 1884, and recorded in the Patent Office July 14, 1884, and the same is marked "Complainant's Exhibit Assignment Shire to Kirkpatrick."

Also a copy of an assignment from Thomas J. Kirkpatrick to the Pope Manufacturing Company of the Shire patent, dated September 7, 1885, and recorded September 11, 1885, and the same is

marked "Complainant's Exhibit Assignment Kirkpatrick to Pope Manufacturing Company of Shire Patent."

79 Defendants reserving to themselves the right to contest or disprove such assignments and the execution thereof within the time now agreed upon for putting in defendants' testimony if they should ascertain to their satisfaction that the title to said several letters patent does not rest in said complainant as a matter of fact or as a matter of law.

Cross-examination by C. K. OFFIELD, counsel for defendants, subject to the above objections:

X Q. 18. So that the court may entirely understand and fully appreciate the correct value to be placed upon your three days' efforts so far in behalf of the corporation complainant herein, will you please state what has been your exact relations with that complainant for the last four or five years continuously?

A. I am and have been for the last four or five years attorney for the Pope Manufacturing Company.

X Q. 19. Where has been your office in relation to The Pope Manufacturing Company, complainant, during that time?

A. I have had an office in one of the rooms in the building occupied by that company in Boston, first at 597 Washington street and now at 79 Franklin street, my office being connected with and opening into their principal offices and being, in fact, one of their offices, and I have occupied this office mostly and done my principal business there during that time.

X Q. 20. Who has paid the entire rent of your office during that time?

A. The Pope Manufacturing Company has paid the entire rent of that office.

80 X Q. 21. For the last four or five years or more have you had or have you any other occupation or support except that given you by the complainant?

A. Yes, sir.

X Q. 22. Then you are not entirely in the employment of the complainant, are you?

A. I am in the employment of the complainant, as I have explained before.

X Q. 23. What other occupation have you, if you choose to tell, outside of your employment by this complainant?

A. My principal occupation has been that of attorney and counsellor and solicitor of patents, and in connection with that I have been engaged at times in some other pursuits, but always subordinate to that, and for the last four or five years, as I have explained, I have given the principal part of my time and services as attorney-at-law and attorney-in-fact and solicitor of patents to the Pope Manufacturing Company, being compensated by an annual salary and occupying principally an office with them, as I have explained; but I have had during that time some other occupations and some other source of "support" or partial "support," which I prefer not o go into in detail and which does not seem to me to be material.

X Q. 24. As I understand you, you first became acquainted with the defendant Gormully at the time of the negotiation of the Exhibit License Agreements Nos. 1 and 2; is that so?

A. I think that is the time of my first personal acquaintance with him.

X Q. 25. Where did you meet Mr. Gormully at that time?

A. In Chicago, Illinois.

X Q. 26. Were these exhibits, Nos. 1 and 2, executed at Chicago Illinois?

81 A. They were, I believe.

X Q. 27. At what place in Chicago?

A. I think it was at the office of Coburn & Thacher, No. 52 Ashland block; but I cannot be certain at this moment.

X Q. 28. Who is the author of these exhibits, Nos. 1 and 2?

A. If you mean who drew the papers, Mr. Gormully and I drew them together. I had had the printed blanks made some time previously. I find that the parts filled in in script in Exhibit No. 1 are in my handwriting, and a part of Exhibit No. 2, as to the script, is in my handwriting. The rest, I think, is in the handwriting of some one in Mr. Gormully's employ.

X Q. 29. Who is the author of Exhibits No. 1, 2, and 3 so far as the printed matter therein is concerned?

A. I am, perhaps, more than any one else, since they were drawn either from my composition or revision.

X Q. 30. Where was Exhibit No. 3 executed?

A. I do not remember where it was executed.

X Q. 31. In whose handwriting is the written portion of Exhibit No. 3?

A. It is all in my handwriting except the signature of Mr. Gormully.

X Q. 32. Who was present at the time each of these exhibits, 1, 2, and 3, were executed or agreed upon?

A. There was no one present except Mr. Gormully and myself when they were executed and finally agreed upon.

X Q. 33. Did Mr. Gormully conduct his entire negotiations upon which Exhibits Nos. 1, 2, and 3 are founded with you?

A. No; I think not. I think that in each case these
82 agreements were drawn up and signed as the result of correspondence and personal interviews between Mr. Gormully and myself and between Mr. Gormully and Col. A. A. Pope, the president of complainant company, and after other memoranda and drafts had been considered; but when they were signed I think that only Mr. Gormully and I were present.

X Q. 34. Was Mr. Gormully represented by counsel in any of the negotiations preceding or at the time of the execution of these exhibits, Nos. 1, 2, and 3?

A. He was not at the time of the execution of the agreements, and I do not remember that he was during the negotiations.

X Q. 35. Who were the attorneys, if it had any, of the complainant herein at the time of the execution of the Exhibits 1, 2, and 3 in Chicago?

A. Messrs. Coburn & Thacher were complainant's attorneys in other matters, but not in respect to these agreements.

X Q. 36. At the time these exhibits, Nos. 1, 2, and 3, were negotiated and executed you were well aware of the fact that Mr. Gormully knew but little about the manufacture of bicycles or any patents relating to bicycles, *did* you not?

A. No. At the time of the negotiation of the first exhibits I was informed by him that he had taken advice and made investigations in regard to the patents relating to bicycles, and was given to understand that he knew a good deal about them and about their manufacture, though he had not then long experience with them.

X Q. 37. Following the example of my brother Coburn, I will ask you, in your judicial capacity, if you decide that Exhibits No. 1 or No. 2 are now in force or effect in any manner as to any covenant or condition?

83 A. I do not understand that I am now acting in any judicial capacity.

X Q. 38. Well, as counsel for the complainant, have you claimed or do you intend to claim or assert that Exhibits No. 1 and No. 2 were in force or binding in any manner on the defendant Gormully at the time of the commencement of any of these suits?

A. I am not testifying in the character of counsel for the complainant, and respectfully decline to answer.

X Q. 39. Well, as a witness, then, or in whatever capacity you saw fit to handle Exhibit No. 3, please answer the question.

A. And what is the question, please?

X Q. 40. Questions Nos. 37 and 38 repeated.

A. But I have declined to answer those questions.

X Q. 41. Why?

A. Because they are addressed to me in a judicial or professional capacity and not in such form that I can answer them understandingly as a witness.

X Q. 42. Please consider that they are addressed to you in exactly the same capacity, whatever that was, as exhibited by the examining counsel-in-chief relating to Exhibit No. 3, and state whether or not Exhibits No. 1 or No. 2 were in force against the defendant Gormully in any manner at the date of the beginning of any of the suits in which he is a defendant.

A. I think they were.

X Q. 43. Identify fully wherein.

A. I think the agreements were in force for the adjustment of "any payment, return, liability, or performance which may have accrued, become due, or arisen," to quote the words of the tenth section of Exhibits No. 1 and No. 2; and also that they were in

84 force as to the agreement in section "seventh" and section "tenth," relating to the manufacture and sale of "any bicycle or tricycle or velocipede embodying the inventions claimed in the aforesaid patents or either of them."

X Q. 44. Your views as to the matter just expressed are quite as positive as any previous testimony you have given in relation to Exhibit No. 3, are they not?

A. No, sir; because in reference to these exhibits my last answer necessarily goes to a matter of opinion, whereas my answers in reference to Exhibit 3 went mostly, at least, to matters of fact.

X Q. 45. All of these exhibits, 1, 2, and 3, were formally surrendered and given up by defendant Gormully to the complainant before the commencement of any suit against him by it, were they not?

A. I don't distinctly remember, but I believe they were.

X Q. 46. At the time Exhibits 1, 2, and 3 were executed how many manufacturers of bicycles were there in the United States?

A. I think there were four manufacturers and one or two small makers and a considerably larger number of makers of little machines sold through the toy trade, principally of wooden construction.

X Q. 47. Name the four manufacturers of bicycles and tricycles in this country in 1883 and 1884.

A. The four manufacturers of bicycles referred to were—

The Pope Manufacturing Company, this complainant;

The St. Nicholas Toy Company,

The Western Toy Company, and

McKee & Harrington,

85 I think, in June, 1883. In December, 1884, I think, McKee & Harrington were out of the business, but Gormully & Jeffery were in the business and were then manufacturing.

X Q. 48. Were any other parties in 1883 and 1884 manufacturing tricycles in this country besides those named?

A. Yes; the Overman Wheel Company were manufacturing tricycles in 1884.

X Q. 49. Who of the above-named parties in 1883 and 1884 held and acted under any license from the Pope Manufacturing Company under bicycle or tricycle patterns?

A. All of them.

X Q. 50. Did Overman?

A. Yes.

X Q. 51. The St. Nicholas Toy Company and the Western Toy Company were in 1883 and 1884 both of Chicago, Illinois, and manufactured under their license from the Pope Company only children's bicycles or tricycles, did they?

A. Yes; they were both in Chicago and they made children's machines. The St. Nicholas Toy Company made some youth's bicyles also.

X Q. 52. Do any of the parties named by you now acknowledge or admit that they hold license from the Pope Manufacturing Company?

A. McKee & Harrington held a limited license, and do not now either hold it or make machines. The others all have licenses and, so far as I know, acknowledge and admit that — have, except the defendants in this case.

X Q. 53. Has the Pope Company now any other licensees, except the ones just mentioned by you, under any bicycle or tricycle patents owned by them?

86 A. Yes; several.

X Q. 54. Identify them.

A. Stoddard, Lovering & Co.,
William Reed & Sons,
W. B. Everett & Company—all of Boston;
L. H. Johnson, of Orange, N. J.;
A. G. Spaulding & Bros., of Chicago and New York;
The Brown Quadricycle Company, of Philadelphia and Boston.

X Q. 55. Are these last-named parties manufacturers of bicycles or tricycles?

A. William Reed & Sons and A. G. Spaulding & Bros. are makers as well as importers of bicycles. The Brown Quadricycle Company are makers of tricycles or quadricycles or both, and the rest are importers and dealers in English makes of machines.

X Q. 56. Do any of the parties that have been named by you as holding license from the Pope Company hold license under all the patents against which the Pope Company has sued Gormully and the other defendants?

A. They do, under most of them.

X Q. 57. How many manufacturers or dealers or importers of bicycles or tricycles are there now in this country who neither hold nor acknowledge any license of any description from the complainant?

A. Samuel T. Clark & Co., of Baltimore, import and deal in bicycles and tricycles and have surrendered the license from the Pope Manufacturing Company under which they did operate, and that company now has suits pending against them; and the H. P. Smith Machine Company, of Smithville, New Jersey, make a line of machines called "American Star bicycles," of different construc-

87 tion from any others in the market, and in which they avoid using the Pope Manufacturing Company's patents. There are no other manufacturers or dealers or importers now, I believe, who are not licensees of that company.

Adjourned at 4.45 until 9.30 a. m., Saturday, July 30, 1887.

SATURDAY, *July* 30—9.45 a. m.

Met pursuant to adjournment.
Parties present as before.

X Q. 58. Who is the largest competitor of the complainant in this country to-day in the manufacture and sale of bicycles?

A. I think the Overman Wheel Company is. In giving my answer to X Q. 54, 55, and 56 from present memory, I omitted to mention the Springfield Bicycle Manufacturing Company of Boston, who are manufacturers of safety bicycles under license of the Pope Manufacturing Company, and perhaps ought to mention Mr. A. D. Hedger, who makes a few bicycles also under license from that company and in Boston. I take this first opportunity of amending my answers to said cross-questions.

X Q. 59. So that the court may fully understand just what this granting of licenses by the complainant means, we will take up

your principal competitor, the Overman Company. When was this license to the Overman Company granted?

A. The first license to the Overman Wheel Company was granted in May, 1883; the second license, and the one under which they are operating now, was concluded in June, 1886.

X Q. 60. What do you mean by "concluded"?

88 A. I mean no distinction between "granted" and "concluded." The licenses bear date, one May 15, 1883, and the other June 10, 1886.

X Q. 61. Were any of the patents under which you have sued Mr. Gormully and his joint defendants in the first license granted by your company to the Overman Company; and, if so, which patents?

A. The Peters patent was named in the first license to the Overman Wheel Company, the same as now in suit; and the Whitehead patent, which has been offered here in evidence, but which I think is not set up in either of the bills, was also included in that license.

X Q. 62. Between 1883 and June, 1886, the Overman Company manufactured a bicycle which you claimed infringed all the patents under which you have sued Mr. Gormully, did it not?

A. No.

X Q. 63. Well, the most of the patents, then?

A. They manufactured and put on the market in 1886 some bicycles which contained the inventions covered by several of the patents in suit here; prior to that they had made tricycles.

X Q. 64. Prior to June, 1886, the Overman Wheel Company had always claimed and advertised that your bank of patents set forth, Exhibits 1, 2, and 3, were simply a junk shop, and were entirely worthless for any purpose whatever, and that they did not use them, did they not?

A. No, sir; that is not correct, even making due allowance for the art of putting things. The Overman Wheel Company was organized about 1882, for the manufacture of tricycles, with an understanding that they could have a license from the Pope Manu-

89 facturing Company under certain patents; and when, in 1883, they had got ready to put tricycles on the market, they took a license from the Pope Manufacturing Company under several of its patents, and made and sold under it. In 1884, in May, I think, they had made some changes in the construction of their tricycle, and were dissatisfied with some of the terms of the contract of license, and surrendered the latter with a request for a better one. The two companies did not at once agree upon the terms of a new license, and, after some time, the Pope Manufacturing Company brought suits against the Overman Wheel Company, and for something more than a year and a half the two companies were in litigation in respect to contract rights and patent rights, and during that time the Overman Wheel Company made some such claims or representations as are referred to in the question.

X Q. 65. They not only "made" some such claims or representations, but they placed them upon record in their answer and swore to them, did they not, in your suits against them?

A. Yes; they set up in their answers and depositions that they believed some of the patents invalid and that they did not infringe, but they did not maintain those allegations in the suits.

X Q. 66. Did they not maintain them in the suits and present them and rely upon them to the court in the trial of the case?

A. Certainly, they contended in the course of the litigation, both in court and out of it, that some of the patents were invalid, and that they did not infringe.

X Q. 67. During this time prior to June, 1886, the Overman Company had suits against the Pope Company for an infringement upon their patents for bicycles and tricycles, did they not?

90 A. They brought two suits against the Pope Manufacturing Company—one under the Hughes or "Bown" patent, No. 227,632, on bearings for wheels, and the other on the Overman patent, for pedals, No. 329,851.

X Q. 68. And the Pope Company is now a licensee under the patents of the Overman Company or some of them, is it not?

A. Yes; it is a licensee under the Hughes patent and it owns the Overman patent referred to.

X Q. 69. Under what patents is the Overman Company now a licensee from the Pope Company? Identify them.

A. The Overman Wheel Company is a licensee under the Whitehead patent, No. 194,980; the Peters patent, No. 197,289; the Work patent, No. 246,650; the Veeder patents, Nos. 244,693 and 252,280; the Moran patent, No. 245,542; the Latta patent, No. 301,245; the Harrington patent, No. 240,905; the Kirkpatrick patent, No. 314,142; the Shire patent, No. 216,231; the Overman patent, No. 253,275, and the Overman patent, No. 329,851, with some limitations.

X Q. 70. The Pope Company cannot grant any license now on any of these patents mentioned without the consent of the Overman Company, can it?

A. In reference to the Peters patent and several other anti-friction-bearing patents owned by the Pope Manufacturing Company, the latter agreed with the Overman Wheel Company that it would not grant licenses under them for laterally adjustable ball bearings in velocipedes without requiring it as a condition with any such licensee to take a license from the Overman Wheel Company under the Hughes patent.

X Q. 71. That is what I thought; and the Pope Company
91 and the Overman Company both got their patents out of court before any judge could pass upon their scope or validity, did they not?

A. Well, they settled their suits on both sides before they had been decided. Except as to two or three which were dismissed without prejudice, decrees were consented to.

X Q. 72. Stripped of all circumlocution or evasion, this mutual exchange of licenses between the Pope Company and the Overman Company was simply a "you tickle me and I'll tickle you" business affair, based upon two confessed facts upon both sides, viz., that the court, if you gave it the opportunity, would rapidly and

cheerfully wipe out all the patents on both sides, if left with the court for final decree; second, that by each side making a business arrangement together you could avoid this result, and by the proceedings you went through give an appearance of stability to perfectly valueless patents; isn't this about the size of it?

A. No, sir. Waiving the imputation of evasion, I answer there was nothing of the kind. The question states not merely an ingenious perversion of the fact-, but a complete and unmitigated misrepresentation of them. The parties had been in litigation for a year and a half and the fight had become bitter, and the parties declared a truce for the purpose of considering a settlement, and they met with their counsel on neutral ground and made a treaty as to all matters in dispute between them, and each side secured and granted good and sufficient value received.

X Q. 73. Perhaps, and — will see. You admit, do you not, that laterally adjustable ball bearings or anti-friction bearings
92 are absolutely vital and essential to the practical and successful manufacture and sale of velocipedes to be used by men at this day, do you not?

A. Not absolutely essential, but very desirable.

X Q. 74. Don't let us mistake the point of the question. Can a bicycle be practically manufactured and sold on the market to-day which can compete with laterally adjustable ball bearings without such adjustable ball bearings?

A. No; I think not, if I understand the question aright, although many bicycles are made and sold without such bearings.

X Q. 75. You know, do you not, that the Overman Company openly assert and maintain at this day that each and every of these patents that you have mentioned as being in their license are perfectly worthless and useless, in the sense of being necessary at all in the manufacture of bicycles and tricycles, and you know, do you not, that the Overman Company, by its officers and counsel, at this day unhesitatingly assert that they dictated to the Pope Company the licenses in question, and that they "Bown" adjustable ball-bearing patent is the only patent in these conjoined licenses that is worth anything?

A. No, sir; I don't know it and I don't believe it, and if they do assert it, it isn't the fact.

X Q. 76. Interrogating you in whatever capacity you saw fit to construe and interpret Complainant's Exhibit No. 3, and taking this Overman license as a sample of the licenses granted by the Pope Company under the facts admitted by you, don't you think it requires considerable hardness and power of face for the Pope Company to claim any prestige or advantage for the patents in suit by reason of such license?

93 A. I decline to answer the question. I have offered to testify here as a witness to facts within my knowledge and, if necessary or desired, as a mechanical expert, and I am ready to answer any reasonable question which does not contain in it an obvious insult either to my honesty or intelligence.

X Q. 77. I have understood from your deposition that you have

attempted to give prestige and standing to the patents in suit against Mr. Gormully by a volunteered assertion on your part that a number of parties had taken license from the Pope Company under these patents; am I mistaken in this?

Question objected to and also further cross-examination of the character of the cross-examination thus far in reference to the Overman matters, for two reasons: First, because there was no direct examination about it; second, because there has thus far been no inquiry about facts, but only about supposed "cheek" or hardness of face—slang, such as the supposed "size of it"—which is simply lumbering up the record with immaterial and irrelevant matters.

A. Yes, you are mistaken. I have not "attempted to give prestige and standing," as you assume; but when you ask me who were licensees and under what patent, I have tried to answer according to the facts inquired of.

X Q. 78. To what end and purpose, then, did you assert at different portions of your direct examination to the effect that the complainant had licensees in various parts of the country if you did not mean in this manner to give the court to understand that these patents had been recognized in this way, and thus give standing to them?

A. The end and purpose of whatever I have said was to answer the questions propounded to me.

94 X Q. 79. How much did the complainants give for "Complainant's Exhibit Peters Patent"?

Question objected to because it is immaterial what they gave for it, the things material being whether the complainant owns it and what there is in it.

Defendant's counsel states that he puts this interrogatory as to this patent in suit, and shall put it as to all the other patents in suit, for the purpose of supporting and proving the theory of defendant's counsel, that each and every of the patents in suit are worthless paper patents, that have been picked — by the complainant for a few dollars each, on account of their acknowledged and recognized worthlessness, and have been picked up and purchased by the complainant for the sole purpose and effect of idealizing their bold, worthless claims into some construction that has for its sole object the harrassment, litigation, and embarrassment of a competitor in business in the Federal courts without any just ground of assertion of right.

Counsel for complainant does not admit that such a defense as just stated to a patent is a valid defense, and especially to a patent which the defendant had admitted and agreed, for a valuable consideration, to be valid, and that the mechanisms which he or his associates are now making are contained in and covered by said letters patent, and, further, that they would not make such mechanisms.

A. I do not know.

X Q. 80. Please follow your custom here and refer to your book

or to the next room and answer the question, as your office adjoins the other offices of complainant.

95 Question objected to for reasons given above and because of assertions and insinuations contained therein.

A. I believe I have no book or memorandum in my control which would enable me to give you the amount given for that patent. I did not negotiate its purchase. I have a general impression and recollection that the amount was several hundred dollars, but not a large sum.

X Q. 81. How many patents besides that in suit did they get of the three Peters for this several hundred dollars?

A. So far as I know the company has no patent that was ever owned by the Peters except the one in suit, and that was obtained of Mr. Drew, who, I believe, purchased it of Mr. Peters.

X Q. 82. Drew purchased it for the company, did he not?

A. I don't know of my own knowledge.

X Q. 83. The assignments of this Peters patent show that the title went to Drew from the Peters in October and was passed from Drew to the complainant in November, 1882, do they not?

A. Yes; they do.

X Q. 84. Do you know Mr. Drew?

A. Yes, sir.

X Q. 85. Did you know him in 1882, and what was his business?

A. Yes; I knew him in 1882. He was a painter and an artist.

X Q. 86. Did he then do any work for the complainant?

A. I don't know whether he was doing any work at that time for the complainant. In the summer season he was accustomed
96 to pursue his old trade of painter at times, and several times, I believe, he painted signs for the complainant.

X Q. 87. The subject-matter of the Peters patent was somewhat foreign to his profession as an artist, was it not?

A. I should think it was.

X Q. 88. You drew both of the assignments—Peters to Drew and Drew to the company—did you not?

A. I think I did. I think that Mr. Drew had some kind of an assignment from Peters when I came to draw an assignment from him to the company that was not satisfactory to me, and that I made another draft of assignment which should be satisfactory, which was executed, and is the one in evidence. I drew the original of the assignment from Drew to the company.

X Q. 89. Can't you remember now whether Drew purchased this Peters patent for the company?

A. No; I don't know that he did. He may have done so.

X Q. 90. How much did the complainant pay for "Complainant's Exhibit Veeder Patent"?

Objected to for reasons given above.

A. I do not remember. The three Veeder patents were bought at the same time, and a considerable sum was paid for them.

X Q. 91. About how much in the aggregate?

A. I do not know, and if I did know I do not remember. The complainant has purchased a good many patents from time to time for sums ranging from several hundred to several thousand dollars. I have not purchased them. Sometimes I knew how much was paid and sometimes I did not.

97 X Q. 92. Did these Veeder patents come under the head of the "several hundred" or the "several thousand" dollar class of purchase?

A. My impression is that they cost more than a thousand dollars.

X Q. 93. To save time will you examine and ascertain what the complainant paid for each of the letters patent offered in evidence here and marked as exhibits in this case, so that you may answer as to the same at the meeting of your next adjourned examination?

A. No; I don't think I will undertake it. The patents were not purchased by me, and, as I have said, I have neither personal knowledge nor books nor memoranda under my control which show how much was paid for them. I could only ascertain approximately and give you my information and belief as well as I can remember, and that I will give you now if you wish it.

X Q. 94. Will you ascertain approximately between now and your next examination and answer?

A. I don't think I will, because I don't understand that that is a part of my duty as a witness, and it seems to me to be an inquiry into business matters which I need not be required to put on record.

X Q. 95. Do you refuse to answer the question and furnish the information approximately?

A. No; I have endeavored to answer it.

X Q. 96. About how much did the complainant pay for "Complainant's Exhibit Kirkpatrick Patent"?

Same objection.

A. That I cannot tell. A part of the consideration for the assignment of the Shire and Kirkpatrick patents and the business established under them was, I believe, paid down, and a part of it was to be paid, and is paid, I believe, in the way of fees or royalties on saddles made and sold.

98 X Q. 97. What fee or royalty does the complainant pay under the Exhibits "Kirkpatrick Patent" and "Shire Patent" now?

A. I do not know.

X Q. 98. If you did not know that the amounts paid for all these patent exhibits were so small and trifling you would ascertain and give them in a very few minutes, would you not?

A. No; that isn't the way of it nor the reasons. My best impression is that somewhere about $12,000 was paid for the Shire and Kirkpatrick patents, somewhere between $1,000 and $3,000 for the Veder patents, and about four or five hundred dollars for the Peters

patent. Now, I can answer in this way as to the other patents or some of them which are offered in evidence, and I am ready to so answer if you desire to interrogate me.

X Q. 99. Relevant to the correctness of your approximation to these amounts, there is a memorandum or indication upon or connected with the original assignment of Shire of his patent showing that the title which you took to that patent was sold by him for one hundred dollars.

A. No; that is not correct either in the reference to fact or in the implication. The Shire patent was not purchased by the Pope Manufacturing Company of Shire himself, but of Mr. Kirkpatrick, who had made it more valuable. When I showed you the original assignment from Shire to Kirkpatrick, a copy of which has been put in evidence, there was pinned to it a small slip of paper which I pinned there and which I found in the papers when they were handed to me, and on which, I think, I had marked "memo." in one corner, and that memorandum reads as follows: "T. J.
99 Kirkpatrick: If you will pay me one hundred dollars I will grant you an exclusive right to the use of my patent of June 3, '79, so far as it pertains to the seat or saddle, I to retain the right to manufacture for my own use or trade; this offer to be open for twenty days. John Shire. June 26, 1884." That is all there was of "memorandum or indication," and it had nothing to do with my approximation to the amount paid *the complainant* by the complainant to Mr. Kirkpatrick for the Shire and Kirkpatrick patents.

X Q. 100. What did complainant pay for "Complainant's Exhibit Moran Handle Patent"?

Same objection repeated.

A. I do not know; I have no recollection about it except that I have an impression that it was a few hundred dollars.

X Q. 101. Answer the same question as to "Complainant's Exhibit Whitehead Patent."

Same objection repeated.

A. I do not know; my impression is that it was about a thousand dollars.

X Q. 102. Answer the same question as to "Complainant's Exhibit Benham Patent."

Same objection repeated.

A. I cannot answer in the same way about that. It is for an invention that was made and patented in connection with the manufacturing business of the Pope Manufacturing Company.

X Q. 103. That means, I suppose, that it was a patent solicited by you and assigned by Benham to the Pope Company without charge, does it not?

A. It was a patent solicited by me and was assigned to the
100 Pope Manufacturing Company in pursuance of agreement between that company, the Weed Sewing Machine Company,

and Mr. Benham, I believe, but what the consideration was I am unable to state.

X Q. 104. Please answer the same question as to "Complainant's Exhibits Wallace Patents" Nos. 1 and 2 respectively.

A. They, too, were for inventions made and patented in connection with the manufacturing business of complainant and assigned to complainant in the course of dealings or agreements between that company, the Weed Sewing Machine Company, and Mr. Wallace.

X Q. 105. As far as you know, the complainant paid no money for either of the Wallace patents or the Benham patent, did it?

A. Well, I haven't any personal knowledge about it except of the relations of the parties, but my impression is that the company paid for the time and expenses of the pateatees spent upon those inventions and models and the expenses of taking out the patents, and that any further considerations paid were covered in general payments for other things, so that the separate consideration paid for either of those patents cannot now be ascertained.

X Q. 106. Please answer the same question as to "Complainant's Exhibit Latta Patent."

A. I do not know how much was paid for that, but it was one of several patents, I think, assigned at the same time for which several thousand dollars were paid.

X Q. 107. Have you intended to state that any of these patents sued upon relate in any manner or control the size of a bicycle or tricycle in which they may be employed?

A. No, sir.

101 X Q. 108. Do you assert that any of these patents relate in any manner or control the application of nickel or enamel to the machine or to the finish of the machine?

A. No, sir.

Adjourned at 1.45 until 10 a. m. Monday, August 1, 1887.

Met August 1, 1887, at 10 a. m., pursuant to adjournment.
Parties present as before.

X Q. 109. Did you draw the assignments which passed title to these various letters patent sued upon to the complainant?

A. Some of them I did.

X Q. 110. A number of parties manufacture parts of bicycles in this country whom you have not mentioned, do they not?

A. There are parties manufacturing the rubber tires used on bicycles. These are different rubber companies. I do not at present think of any others. Yes; there are, I think, two or three steel-working concerns that make small steel balls for ball bearings.

X Q. 111. In what court was this litigation carried on between the Pope and the Overman Companies, where the cases were settled, and the respective decrees entered?

A. In the circuit court of the United States for the district of Massachusetts, and also for the district of Connecticut, and there was some litigation between them in the supreme judicial court for

the Commonwealth of Massachusetts and one or two of the State courts of Connecticut.

X Q. 112. Do you know anything about the corporation defendant in these suits or who are its stockholders?

A. I do not know who are its stockholders at the present
102 time. All that I have known about it has been derived from notices and communications from Gormully and Jeffery and the succeeding company and a commercial agency.

X Q. 113. Do you claim that the complainant is manufacturing its bicycle or tricycle structures under each and all of the letters patent declared upon in these various suits?

A. Yes, sir.

X Q. 114. Do these patents sued upon vary in value and importance in bicycle structures?

A. I suppose so.

X Q. 115. Which is the most valuable patent sued upon?

A. I don't think I have a carefully drawn judgment on that point; indeed, it would be difficult to differentiate their value and assign a scale to them.

X Q. 116. Can you answer the question? If so, do so.

A. I do not think that I can answer any more satisfactorily which is the most valuable. They are all valuable by themselves and together, and their value depends upon or, rather, is contributed to by a number of considerations, and any judgment I might give offhand as to which is the most valuable would be only approximate and probably erroneous.

X Q. 117. Are any of the patents sued upon more valuable than the Peters patent?

A. I have already explained to you that I am not able to give you an estimate of the comparative value of these several patents.

X Q. 118. Can a practical and successful bicycle be manufactured and sold to-day without embodying in it the Peters patent?

103 A. Yes, sir; of course there is much latitude in the application of the terms "practical and successful;" but if you mean to ask whether a completely operative and saleable bicycle can be made without the use of the Peters patent I have to answer that it not only can be made now as well as it could three or four years ago, *and* is made and sold and used, and, amongst others, I believe, largely by the defendants.

X Q. 119. So that the court may understand just what the facts are and may not misunderstand you when you state that the complainant constructs its bicycle machines under and in accordance with the patent sued upon, we will take, for example, the Peters patent and compare it with complainant's bicycle structure, which more nearly approaches the construction of that patent, and I will ask you if complainant's bicycle contains now or ever has contained the roller marked "Fig. 1" of the Peters patent.

A. I don't know that I understand your question, but if you mean to ask whether the complainant's machines, any of them, contain a roller of exactly the shape and dimensions of that shown in "Fig. 1" I answer that they do not.

X Q. 120. Will you please describe to the court the nearest approach in configuration to "Fig. 1" of the Peters patent that has ever been used by complainant?

A. The rollers mostly made and used by the complainant are spherical in form. They have used, however, cylindrical rollers and, I believe, conical rollers and spheroidal rollers, but not to any great extent, as spherical rollers are practically better to manufacture and sell.

X Q. 121. Do you mean by spherical rollers such rollers as are contained in Complainant's Exhibit "Defendant's American Light Champion Bicycle"?

104 A. Yes, sir; similar ones.

X Q. 122. To obviate asking a number of detailed questions as illustrative of the point in question I will ask you if the complainant comes any nearer embodying Complainant's Exhibit "Peters Patent," as manufactured to-day, than is shown by the structure of defendant's bicycle offered in evidence.

A. No nearer than in the exhibits "American Champion" and "American Light Champion" bicycles, but embody them substantially the same as the bearings of these are substantially copied from complainant's machines.

X Q. 123. The bearings of these defendants' machines are also substantially copied from machines of the Overman Company, constructed under the ball-bearing patent of "Bown," under which patent the Pope Company holds license, are they not?

A. No; I should not say so, because they are not copied so closely after the construction of those bearings, if they are copied at all. There are certain differences in details of construction between the bearings of the Overman Company and those of this complainant, and as to these differences the defendants have substantially copied the complainant.

X Q. 124. Please identify here by number and date the "Bown" patent, under which the complainant holds license from the Overman Company.

A. It is the patent No. 227,632, dated May 18, 1880, to J. H. Hughes, assignor to William Bown, for bearing for wheels.

X Q. 125. Calling your attention now to your answer to Q. 12, direct examination, and following the identification numbers

105 there used by you, I will ask you if any of the patents sued upon—and, if so, which one—contains any claim which you assert is embodied in any bicycle structure of defendant, viz., a claim for a "backbone bifurcated for a rear wheel."

A. I do not assert that either of the patents sued upon here contains a claim for the bifurcated backbone.

X Q. 126. Do you assert that any of the patents sued upon here covers "bearings containing balls or rollers, laterally adjustable," which has been embodied in defendant's machine? Is so, please identify the patent and the claim.

A. Yes, sir; the patents relating to this feature have already been identified by me as the Peters patent, second clause of claim, and the Wallace patents in the claims pointed out.

X Q. 127. Do you assert that any patent sued upon contains a claim for a "brake combined with the handle bars and front wheel," and that this construction is found in any of defendant's machines?

A. I did not refer to any of the patents sued upon, and do not now.

X Q. 128. Do you find any claim in any patent sued upon which compared with defendant's machines contains "cranks adjustable to different lengths of throw"?

A. I haven't examined to see, but I did not refer that feature to either of the patents in suit and it isn't covered or related to by either of the claims that are in suit in those patents.

X Q. 129. Do you find any of the patents sued upon containing any claim for "forks of tubular construction"?

A. I did not refer that feature to either of the patents in suit.

X Q. 130. Do you find any claim in any patent in suit
106 which refers to "round contractile rubber tires in grooved rims"?

A. I did not refer that feature to either of the patents in suit.

X Q. 131. Does any patent in suit contain any claim for "steering head, * * * cylindrical, with stop from complete turning"?

A. I did not refer that feature to either of the patents in suit.

X Q. 132. Does any patent in suit contain any claim for "leg-guard over front wheel"?

A. I did not refer that feature to either of the patents in suit.

X Q. 133. Does any patent in suit contain any claim for "tangent spokes"?

A. No, sir; I believe not; and I did not refer that feature to either of the patents in suit.

X Q. 134. Do either of the patents in suit contain any claim relating to "balance gear allowing two wheels abreast differing in speed on curves"?

A. Not of the patents directly in suit; and I did not refer that feature to either of them; and I wish here to explain in reference to this and to my previous answers that by "patents in suit" I have meant those that were directly and fully set out in the bills as distinguished from those referred to in the agreement exhibits and in the bills but not fully set out.

X Q. 135. You know well enough, do you not, that the Pope Company has now sued these several defendants on every patent which the Pope Company owned that had in it any drawing which represents in the faintest manner the bicycle structure of defend-
ants or has in it any claim which by any flight of imagina-
107 tion or sophistry of reasoning or construction can be idealized or generalized by any paid expert so as to embrace any structure of the defendants?

A. Oh, no; not at all.

X Q. 136. Do you desire to give the court the impression that the Pope Company have any other patent that they haven't sued the defendant on, that they can employ an expert to give an opinion that the defendant infringed?

A. I don't mean to give the court any impression at all about that sort of thing, and I do not think the court will draw any such impression as your questions imply.

X Q. 137. These various devices embodied in the manufacture of bicycles, and concerning which you have replied that you did not refer to them as being covered by any of the patents in suit—such devices are now open and free to be made by anybody, are they not, in bicycle structures?

A. No, sir; not all of them.

X Q. 138. Are they when constructed as constructed by the defendant?

A. No, sir; not all of them, nor in all the forms as constructed by the defendants.

X Q. 139. Has the complainant any patent or patents which relate to "high-grade" machines or in which the "grade" of the machine enters in any way as an element of the patent?

A. It has no patents, as far as I know, in which "grade" is expressed as an element of claim. Some of its patents relate to "high-grade" machines, in that they are for devices used in "high-grade" machines; some of them, perhaps, commercially limited to "high-grade" machines.

108 X Q. 140. The defendants, since April, 1886, have manufactured and sold their "high-grade" machines, like the "American Champion" and the "American Light Champion," all across the country in large numbers, have they not?

A. Well, they began to sell, so far as I understand it, machines like "American Champion" in the early summer of 1886, and machines like the "American Light Champion" in the spring of 1887, and have sold them in considerable numbers across the country up to the present time.

X Q. 141. The defendants have now a large number of established agencies for the sale of their bicycle machines throughout all parts of the United States, have they not?

A. I believe they sell them through agencies that had been established and some that they have established in many places in the United States.

X Q. 142. The defendants advertise their goods distinctly in all the leading bicyle trade journals and papers in the United States, and take great pains to let the bicycle trade know that their machines are of their own manufacture, and that they have no relation to or association with the complainant whatever, do they not?

A. Yes; I understand they do that very largely since these suits were brought.

X Q. 143. The defendant corporation has suits against *against* the complainant in this case for infringements of patents on bicycles sold by defendant, has it not?

A. It has brought one suit against the complainant, as I understand it, upon patents purchased for that purpose since these suits against Gormully and his associates were commenced.

109 X. Q. 144. Who did you "understand" that from?

A. Well, that is my understanding, made up from what I

have heard from a number of people, and that is my belief; but I do not say that I know that the defendant purchased these patents for that purpose. They did purchase them quite recently, if at all.

X Q. 145. Your belief in this matter is founded solely upon your knowledge of the purpose with which the complainant in this case purchased or secured from its employés and others the patents upon which these suits were brought, is it not?

A. Not at all.

X Q. 146. Have the complainants in this case stamped, marked, affixed, or identified in any manner upon their bicycle machines the patents and each of the patents in suit, which you say they embody in such machines, after their date of acquirement?

A. Yes, sir; generally.

X Q. 147. What do you mean by "generally"?

A. I mean that is their regular custom, to mark each of their machines, as patented, with the dates of the patents used.

X Q. 148. Where and how do they mark them?

A. On the bicycles, usually on the dust cap or shield, on the back of the steering head and on the saddles and pedals.

X Q. 149. Don't you know that some of these patents sued upon have never been identified as to their numbers or stamped upon or associated in any manner with any bicycle or tricycle manufactured by the complainant?

A. No; I don't.

X Q. 150. I see by section "seventh" of complainant's
110 "Contract Exhibit No. 3" that complainant was to furnish defendant Gormully with a list of such patents to the end that the date might be marked or stamped upon the machines. Was such list ever furnished?

A. I do not remember.

X Q. 151. Don't you know it was not?

A. No, sir. My impression is that such lists were furnished Mr. Gormully at different times, but I cannot now say that they were. The company used to have printed slips, with dates of patents, to furnish to licensees and sometimes furnished them, and sometimes, when requested, gave the dates in writing, after examination of the machines to be sold by licensee, and I cannot now remember distinctly whether such list were furnished to Mr. Gormully or not.

X Q. 152. Was the complainant in this case ever sued under any of these patents set forth in the several bills or did the complainant ever recognize or pay royalty under any of those patents before they purchased them?

A. If you mean those specifically set up in the bills and offered here as exhibits they were sued under the Overman pedal patent, and as to the others they were never sued, but as to several of them they recognized and paid royalties under them before they purchased them.

C. Q. 153. Identify every patent in suit that the complainant recognized and paid royalty under before purchasing.

A. I dont know that I can do that fully. It paid royalty under the Harrington patent, No. 240,905, and I believe that is all of those

I understand to be meant as "in suit" under which the company actually held license before purchase. In the purchase of
111 several settlement was made for prior use, but usually the company has purchased a patent before using it and has always intended to. They have recognized the patents before purchase, I suppose, in each instance.

X Q. 154. On December 1, 1884, did the defendant Gormully manufacture any bicycle called the "Ideal" bicycle or the "Standard Columbia" bicycle or the "Expert Columbia" bicycle or the "Columbia" or "Victor" tricycle or "Æolus" ball pedals?

A. He or his firm of Gormully and Jeffery manufactured the "Ideal" bicycle, but not the others.

X Q. 155. Who did manufacture the others?

A. The "Standard Columbia" and "Expert Columbia" bicycles and "Columbia" tricycle were made by this complainant, the "Victor" tricycle by the Overman Wheel Co., and the "Æolus" ball pedals were imported from some English maker, and, as I believe, were made either by William Bown or by some concern for him.

X Q. 156. Upon December 1, 1884, or at any other time has this complainant owned any patent on the "Æolus" ball pedal?

A. Yes; it owned the Peters patent, the invention pointed out, in claim 2 of which was claimed and admitted to be contained in those pedals.

Adjourned at 1 p. m. until 2 p. m.

Resumed at 2.15 p. m., pursuant to adjournment.

X Q. 157. What year was it that these "high-grade" bicycles came into use and adoption, so that it became evident that their manufacture and sale was to be an established industry by reason of the growing use and demand therefor in the trade?

112 A. Well, that is a difficult question to answer as it stands. The "Standard Columbia" bicycle began to come into use in 1878, I believe, and was improved considerably afterwards. The "Columbia" and "Victor" tricycles were brought into use about 1883. I think the "Expert Columbia" was first made in 1881 or 1882, but, of course, before and since those dates there have been some other machines which were "high grade." The established industry might date from 1877 or 1878 as to the modern business, since that was when the revival of velocipede construction took place in this country.

X Q. 158. In giving your opinion as to the various letters patent relied upon in these different suits and your comparison of such letters patent with the defendant's machines, as appears principally by your answer to direct question 15, have you made such answer, professing a knowledge of the antecedent state of the art existing as to each patent prior to the date of the application for such patent?

A. I don't understand what you mean by "professing," etc. The questions and answers show the matter now inquired of.

X Q. 159. I mean exactly what I say. Do you profess any knowl-

edge as to the state of the art as to each of the said letters patent prior to the date of each?

A. If you mean to ask whether I have some knowledge of the prior state of the art, I answer that I have some.

X Q. 160. Has this knowledge governed or influenced in any manner the opinion you have expressed as to the respective patents?

A. Undoubtedly it has contributed to the formation of my opinion.

113 X Q. 161. In what manner has this knowledge of the prior art influenced your opinion?

A. It is obvious that I can answer such a question only in a general way. Some knowledge of the art to which a patent relates is always presupposed to exist in the person who is to understand it, and a greater or less degree of such knowledge may affect his understanding of the patent.

X Q. 162. In view of your knowledge of the prior state of the art, have you considered and construed each of the patents in suit, respectively, as being inventions standing at the head of the line to which they belong respectively and entitled to a broad construction, or have you considered them as inventions standing down from the head of the line and to be confined substantially to specific devices?

A. I have considered the patents with reference to the state of the art of velocipede construction as well as with reference to what is fully described and shown therein, and I have endeavored, in coming to conclusions upon them, to give them just interpretation. If I understand your figure of speech rightly, some of them stand nearer "the head of the line," in a comparative sense, than others. For instance, the Whitehead patent is the earliest patent, so far as I have been able to ascertain, to show a combination of a differential driving gear or balance-action mechanism in a tricycle. The Peters patent is the earliest patent, so far as I am aware, to show the combination in a bearing of two conical shoulders on an angle with a series of anti-friction rollers taking their bearings on the conical surfaces of such shoulders, and a nut for adjusting one of the conical shoulders toward the other. The Shire patent is the earliest

114 patent, so far as I am aware, to show an adjustable hammock seat in a velocipede, and so on; and so, in a sense, I do consider some of these patents to stand, as you phrase it, "at the head of the line" to which they relate.

X Q. 163. Each and every claim in all these patents respectively are combination claims, are they not, of old elements associated together?

A. No, sir; not any of them, as I understand it, since mere association of elements does not constitute patentability or invention as I understand it.

X Q. 164. Each and every claim of the different patents sued upon are simply combination claims, are they not?

A. Now, that is a general way of asking as to a large number of claims, some of which I understand to be in suit and some not——

X Q. 165. Please answer as to claims in suit only.

A. No. Some of them are combination claims strictly and some are not.

C. Q. 166. Identify every claim relied upon in each patent respectively that is not a combination claim in your opinion.

A. I do not answer for what claims are "relied upon," but of the claims to which my attention has been directed in this examination the first clause of claim of the Whitehead patent is for a master wheel, etc., and the second clause is for an improved velocipede, etc. The second clause of claim of the Shire patent is for an adjustable hammock seat. The first clause of claim in the Veeder patent, No. 252,280, is for a suspension saddle, etc. The claims of the Moran patent, No. 245,542, are for the handle of a velocipede, etc. The claims of the Overman patent, No. 329,851, are for a pedal for
115 velocipedes, etc. The second and third clauses of claim of the Wallace patent, No. 249,278, are for an anti-friction bearing, etc. These claims are not, in their form, combination claims, but claims for organizations, having certain constructions pointed out. The others are mostly in the form of combination claims, I believe.

X Q. 167. As it appears at once on inspection that each of the claims first mentioned by you—as, for example, the claims of the Whitehead patent—are bare, bald, combination claims, with each and every part and element of the combination itemized and identified by letter or figure, and with no suggestion otherwise, will you kindly state to the court your definition of a combination claim for one reason, among others, so that it may be understood under what conception and intention you have handled these patents?

A. It would be much more agreeable to me to answer a question than to answer a speech, and, as it is also more becoming, probably, I will try to eliminate your question and answer it. I understand a "combination claim" in a patent to be a claim for certain mechanical elements pointed out and co-operating together to accomplish some result.

X Q. 168. Have you meant to state that you do not know and have not intended to handle every claim relied upon by the complainant in this case in handling these patents?

A. No; I don't think I meant to state it in that way. I know, I suppose, what claims are urged by the complainant against the defendant, but as to what specific things are relied on in the suits I leave those to Coburn & Thacher, who are conducting the suits.

116 X Q. 169. Your attention was not directed to any particular claims of these patents in your direct examination, was it?

A. The examination itself shows, I suppose. As I remember it, I was asked to point out certain claims, and did so.

X Q. 170. You replied, a moment ago, that you did not answer for what claims are "relied upon" in these patents, but you answered as to such claims as your attention has been directed to in this examination. Is this true?

A. Yes; I believe it is true.

Redirect examination by L. L. COBURN, Esq.:

R. D. Q. 171. Are the Overman Company obligated in any way in regard to granting licenses for the manufacture of anti-friction ball bearings in bicycles or tricycles?

Objected to, as the agreement itself would be the best evidence of the obligation inquired of.

A. Yes; they are obligated to license any one under the Hughes patent unless such an one first has a license from the Pope Manufacturing Company as to bicycles or tricycles with laterally adjustable ball bearings, and that they will grant a license to any one having such a license from the Pope Manufacturing Company.

R. D. Q. 172. I notice that there is a mark drawn through the number of the Whitehead patent and the Peters patent where they were printed in section "first" of Complainant's "Contract Exhibit No. 3," but they were not stricken out from the "eighth" clause of said license. Please explain to the court whether that was intentional and what reason there was for it, if any.

Objected to as wholly incompetent.

A. Yes; it was intentional. The reason was this: The license
117 form was prepared for licensing importers of foreign machines. In using it for the Gormully license those patents were stricken out, the one because he agreed not to make tricycles and the other because he agreed not to make machines with adjustable roller bearings. The erasure was just as intentional as any of the written parts, and was made because the licensor would not agree to let Mr. Gormully or his company make bearings containing the invention claimed in the Peters patent and referred to in section "eighth" or tricycles containing the balance gear referred to in the Whitehead patent and also in section "eighth."

R. D. Q. 173. Please point out to the court any clauses in contracts No. 1 or No. 2, any language or clauses, by reason of which any portion of said contracts are now in force and binding upon the defendant Gormully or Gormully and his associates.

Objected to as incompetent.

A. In the section numbered "first" of each of those agreements, near the bottom of the first page, certain patents are named under which the defendant had license, including "and 110,057 and 123,571 and 249,447 and 250,316," which patents had not yet expired. In the license No. 1 certain words were erased near the end, and the words stand, as amended, "this agreement shall continue in full force for nine months from the date hereof," which would seem, perhaps, at first, to limit the term of this agreement to a period of nine months from June 13, 1883, but on further inspection of this agreement it appears in section numbered "first" that the machines to which this license was applicable were limited as to construction in certain particulars, and "to a number not exceeding one

hundred in all, said bicycles to be only the finishing up and
118 working off of the materials and stock on hand with said Gormully on the twelfth day of January, 1883;" and in section "seventh" is an agreement that the licensee "will not import, manufacture, or sell, either directly or indirectly, any bicycle or tricycle or velocipede containing the inventions claimed in said letters patent or either of them (among which are the Whitehead, Peters, Moran, and Wallace, No. 249,278, patents referred to in this examination) other than according to the permission, conditions, and description in paragraph numbered 'first' of this agreement or as elsewhere agreed in writing with the party of the first part;" and in the "tenth" clause it is agreed further that "no revocation or surrender shall release or discharge the party of the second part from any payment, return, liability, or performance which may have accrued, become due, or arisen hereunder prior to or at the date of such revocation or surrender," and as further showing the intention of the parties by express agreement to extend the term of this contract to a time beyond any surrender or revocation and beyond the nine months * * * the agreement is expressed in section "tenth," which can only apply to and be in force in such after-time and during the term of the letters patent under which the license run-, "that if the said party of the second part shall continue after such notice or surrender to make, sell, or use any invention set forth and claimed in the letters patent aforesaid, or any of them, the said party of the first part shall have the right to treat him as a mere infringer, and the said party of the second part consents that in such case, upon any suit brought, * * * an injunction may issue, without notice, * * * restraining him," etc.

119 In the agreement No. 2 there is the same recital of patents not yet expired, some other description and limitations of the machines in which the licensee is licensed to use the inventions, the same agreement in section "seventh" that he will not use those inventions otherwise than according to the description in paragraph numbered "first" of this agreement or as elsewhere agreed in writing; but at the end of section "tenth" it is stipulated, "unless sooner terminated, as provided in this section, this agreement shall continue in full force until the full end of the terms for which said letters patent mentioned in section 'first' were granted"—that is, until November, 1898. Now, although the agreement provides that it may be terminated by notice in a certain manner or by surrender in another manner, it contains the same clause as was in agreement No. 1 relating to the time after such notice or surrender, namely, near the end of section "tenth," "that if the said party of the second part shall continue after such notice or surrender to make," etc., the licensor might treat him as a mere infringer, and he consented in advance that an injunction might issue restraining him without notice. Thus in both these agreements the clauses that are still in force, notwithstanding the surrender by the licensee, are the section numbered "seventh" and the clause of section numbered "tenth"

beginning "and it is hereby agreed that if the said party of the second part shall continue," etc., in each.

CHARLES E. PRATT.

Attest: L. G. FARMER, *Examiner.*

120 JOHN E. EARLE, next being produced as a witness to testify on behalf of complainants, first being duly sworn, testified, in answer to questions asked him by the respective counsel, as follows, to wit:

Q. 1. What is your name, residence, and occupation?

A. John E. Earle; fifty-six years of age; reside in New Haven, Connecticut; solicitor of patents.

Q. 2. What has been your experience in relation to scientific and mechanical subjects and structures which would tend to qualify you to testify as an expert in patent causes generally, and especially in patent causes involving the construction and operation of mechanisms shown and described in velocipede, bicycle, and tricycle patents?

A. In 1849 I began the study of mechanical drawing and was engaged practically in this work till 1863. A very large proportion of my work as a practical draftsman was in the perfection of new inventions and devising machinery for special purposes. In connection with mechanical drawing I began the preparation of applications for letters patent in 1851. Beginning January 1, 1862, soliciting patents was a specialty with me in my business. Since that date (January 1, 1862) I have personally prepared more than 7,500 applications for letters patent in the United States and foreign countries. Early in my practice as solicitor of patents it became necessary for me to frequently investigate the state of the art as developed in patents and publications in this and other countries to ascertain and give opinions upon the novelty of inventions—the scope and validity of letters patent—and this I have continued to frequently do up to the present time.

121 During the past twenty years I have testified as mechanical expert in a very large number of patent causes in the United States courts. I have been employed as one of several boards of arbitration selected to ascertain and determine the validity, scope, and value of a large number of letters patent. I have also acted as referee in cases involving like questions. I have also acted as inspector, appointed by the courts, to visit manufactories, examine machinery and processes in practical operation on disputed points, and to report thereon.

In 1866, as solicitor, I procured, I believe, the first patent on the two-wheeled velocipede, or bicycle as they are now called, granted in this country.

The novelty of the machine as a vehicle interested me very much, and later, when these machines began to be used and improvements to be made thereon, I watched the progress with much interest and kept myself familiar with the inventions made in these vehicles.

I have been many times consulted regarding inventions in velocipedes, and have made many examinations in the state of the art bear-

ing thereon in this and foreign countries to determine or answer questions of novelty or infringement, and have testified as expert in numerous causes in the United States courts based on patents for this class of inventions.

Q. 3. Please look at the Peters patent, No. 197,289, marked "Complainant's Exhibit Peters Patent;" also letters patent 249,278, marked "Complainant's Exhibit Wallace Patent No. 1;" also letters patent No. 280,421, marked "Complainant's Exhibit Wallace Patent No. 2," and state whether you are familiar with the same; also examine the machine exhibit marked "Complainant's Exhibit Defendant's American Champion Bicycle" and the one marked "Complainant's Exhibit Defendant's American Light Champion Bicycle" and
122 state whether you are familiar with the construction of the same; also compare the mechanisms relating to the ball bearings in said machine exhibits with those in the patent exhibits and point out to the court wherein they correspond with or differ from each other, and more especially so far as said mechanisms are made the subject-matter of the clauses of claims in said patent exhibits.

A. I am familiar with the several patents referred to in the question, and have also examined the two machines referred to to make the comparisons called for.

Referring first to the Exhibit Peters Patent, I find the invention of that patent to relate to the construction and arrangement of devices between the wheel and axle whereby the friction between the wheel and axle may be reduced from what it would be were the wheel to revolve with a rubbing bearing directly upon the axle. The devices of the patent consist of a series of rollers between the wheel and axle and which produce a rolling bearing between the wheel and axle in contradistinction to rubbing surfaces in close contact, such as a box in the hub closely fitting the axle. Rolling devices of this character are commonly called anti-friction.

The invention of the Peters patent is not to be understood as to include broadly anti-friction or rolling devices between the wheel and the axle, the invention of the patent being for certain peculiar devices for the support and maintenance of the anti-frictional devices in their proper relation to each other.

One of the features specially mentioned in the said Peters patent consists in an annular beveled shoulder on the axle and a beveled nut, the bevel of the nut and bevel of the shoulder of the axle diverging radially from the axle so as to form an annular groove around the axle, the opposite sides of which diverge radially from the axle.

123 The anti-frictional devices are represented as in the form of a series of rollers corresponding to the annular groove around the axle and so that the rollers may take their bearing on the beveled surface of the shoulder and the oppositely beveled surface of the nut.

The peculiar device which I have described is illustrated in figure 4. F represents the beveled shoulder on the axle and G represents the beveled nut.

The specification provides that the bevels may be smooth, or that

they may be notched to form cogs, the corresponding surfaces of the rollers made accordingly, so that the rollers may revolve on the beveled surfaces of said nut and shoulder as their bearing.

The peculiar features of the Peters patent which I have described are particularly recited as the elements of combination of the second claim, which is as follows:

The bearings with the shoulder, beveled or notched, combined with the nut or its equivalent, correspondingly beveled or not, as shown in Fig. 4.

I understand the invention, as recited in the said second claim, to be for an axle having an annular beveled shoulder thereon combined with a nut having an oppositely beveled surface, so that the beveled surfaces of the nut and shoulder form an annular groove around the axle, the opposite sides of which groove diverge radially, the said groove being adapted to receive a series of anti-friction rollers and so that the said beveled sides of said groove will form the bearings upon which the said rollers will run.

Comparing, now, the invention cited in the second claim of the Peters patent with the wheel bearings of "Complainant's Exhibit Defendant's American Champion Bicycle" I find in said ex-
124 hibit that the forward wheel is made fast to the axle, so that the axle revolves with the wheel.

The axle is provided with an annular shoulder, presenting a beveled surface, and upon the axle a sleeve is placed presenting an oppositely beveled annular surface, so that the said shoulder on the axle and sleeve together form an annular gro-ve around the axle, the opposite sides of which diverge radially from the axle—substantially the same annular groove as that produced in the Peters patent by the beveled shoulder and beveled nut. The beveled sleeve of the exhibit is a clear equivalent for the beveled nut of the Peters patent because it presents a like beveled surface in substantially the same relation to the beveled shoulder on the axle as does the beveled nut of the Peters patent, and it performs substantially the same function in substantially the same way.

In the said exhibit a series of anti-friction rollers are arranged in the said annular groove in substantially the same manner as the series of anti-friction rollers are arranged in the Peters patent. For the reason, therefore, that I find in the said Exhibit "American Champion Bicycle" the bearings with the shoulder beveled, combined with the nut or its equivalent correspondingly beveled, as shown and described in said Peters patent, and particularly recited in the second claim thereof, I am clearly of the opinion that the said exhibit embodies the invention recited in the said claim of the Peters patent in each of the bearings of the forward or driving wheel.

I have taken into consideration the fact that whereas in the Peters patent the anti-friction rollers are several diameters in length in "American Champion Bicycle" the rollers are but one diameter in length—that is, they are in the form of spheres, but this I do
125 not understand to be a material difference, as the combination and the result of the combination of elements is not

changed or qualified by reduction or increase in the length of the rollers.

Referring now to the rear wheel of the Exhibit American Champion, I find the axle to be fixed in the respective ends of the fork between which the wheel runs and so that the wheel is loose upon the axle. The axle is provided with a nut near each end, the inner end of the two nuts being beveled corresponds substantially to the shoulder F and the nut G of the Peters patent—that is to say, one of the nuts forms the beveled shoulder upon the axle and the other nut forms the beveled nut, so that the two together produce an annular groove around the axle, the opposite sides of which diverge radially from the axle. I therefore find in the rear wheel of the said exhibit the beveled shoulder and the nut correspondingly described and illustrated in the Peters patent, and particularly recited in the second claim thereof.

I take into consideration the fact that in the Exhibit "American Champion" there are two series of rollers, one series of which runs against one of the annular bevels or at one side of the annular groove, while the second series run upon the other bevel or other side of the groove. The interior of the hub is constructed with annular grooves, corresponding to the respective series of rollers and so that the rollers work between the respective beveled surfaces on the axle and corresponding surfaces in the box, but this I do not understand to constitute a material difference from the Peters patent for the reason that in the said exhibit there is the same annular groove on the axle, with oppositely beveled sides, and the same groove is adapted to and does receive the anti-friction rollers
126 substantially the same as in the Peters patent. In the said exhibit the two series of rollers become practically one by the connection which the interior of the hub makes between them, the two series of rollers with the beveled shoulder and nut, and the connection between the two series of rollers making them substantially one series, performs all the advantage and accomplishes all the results due to the beveled shoulder and beveled nut of the Peters patent. I am, therefore, of the opinion that the rear wheel of the said Exhibit "American Champion" fully embodies the invention of the said Peters patent, and particularly recited in the second claim thereof.

Referring now to the crank pedals of the said Exhibit American Champion, I find an axle having a hub carrying the pedal frame adapted to revolve freely thereon. The axle is constructed with an annular shoulder near its inner end, and has combined with it a nut on the outer end; the opposing faces of the shoulder and the nut form an annular groove around the axle, the sides of which diverge radially from the axle, the said groove being adapted to receive anti-friction rollers and so that the said rollers may revolve on the diverging faces of the same annular groove. Between the hub on the axle and the said diverging surfaces two series of spherical rollers are introduced, one series arranged to run upon one of the diverging sides of the groove on the axle and the other series are arranged to run on the other diverging sides of the groove, the hub making

the connection between the two series of rollers so they become substantially one series and as in the hub of the rear wheel of said "American Champion," as I have already described; the axle of the pedal and the axle of the said rear wheel differing only in the fact, so far as the Peters patent is involved, in that the axle
127 of said rear wheel has both shoulders or diverging bearing surfaces made in the form of nuts, whereas in the axle of the pedal one shoulder is found on the axle and the other is a nut—immaterial differences, as I understand them. For the same reasons, therefore, which I have given in referring to the rear wheel of said American Champion I am of the opinion that the pedals of the said American Champion involve the invention of the Peters patent particularly recited in the second claim thereof.

I now consider the second machine, Complainant's Exhibit Defendant's "American Light Champion."

In the forward or driving wheel of this machine I find the axle to be substantially the same, not to say identically the same, as that in the before-mentioned exhibit, the "American Champion." The axle is provided with the same bevel annular shoulder and with the same annular beveled sleeve, said sleeve and shoulder together forming an annular groove with diverging sides around the axle as in the "American Champion" and with the same series of annular rollers. Therefore, for the reasons already given in reference to the Exhibit "American Champion," I find in the driving-wheel "axle" of said exhibit, "American Light Champion," the invention shown and described in said Peters patent, and particularly recited in the second claim thereof.

In the rear wheel of "American Light Champion" I find the axle, hub, nuts, and anti-friction rollers the same as in Exhibit "American Champion," and, for the reasons already given, I find the rear wheel and axle of the Exhibit "American Light Champion" to contain the invention shown and described in the said Peters patent, and particularly recited in the second claim thereof.

128 In the said Exhibit "American Light Champion" I find the pedals, so far as the hub and axle are concerned, to be the same as the pedals of the "American Champion," and, for the same reasons which are given in regard to the latter, I find the former to contain the invention shown and described in the Peters patent, and particularly recited in the second claim thereof.

I now take up the Complainant's Exhibit "Wallace Patent No. 1." Like the Peters patent, this invention relates to an improvement in that class of anti-friction roller bearings in which a series of rollers are arranged between the axle and the hub, the invention being designed more especially for rollers in the form of spheres.

One feature of the invention consists in forming a groove on the axle by applying thereto a two-part sleeve or two sleeves, the division between the two sleeves being in an annular *plain* around the axle, the adjacent faces of the two parts beveled so as to form an an-

nular groove around the axle, the two sides of which groove diverge radially from the axle. One part of the said sleeve is made adjustable toward or from the other part, whereby the width of the groove may be expanded or contracted. Combined with this is a box having an internal annular groove presenting two oppositely inclined surfaces, substantially corresponding to the two sides of the annular groove *found* by the two-part sleeve, and with a series of spherical rollers in the groove around the axle and extending into the groove in the box, and so that when properly adjusted the rollers will take their bearings upon the oppositely inclined sides of the groove in the axle and the oppositely inclined sides of the grooves in the box.

I understand the second claim of the said patent to recite as the invention the combination of the bearing box in the wheel, a two-part sleeve on the axle, the said sleeve and box constructed to form opposing annular grooves, and a series of rollers in said gro-ves, one part of the said sleeve provided with means for adjusting it toward or from the other part of the sleeve, whereby the respective sides of the said grooves may be made to take proper bearing upon the rollers as the rollers or surfaces may become warm. I understand the invention as recited in the third claim to be the same as that recited in the second claim, except that it includes as an element of the combination a screw-threaded box to engage a corresponding screw-thread on one part of the sleeve, the said box being secured to the axle.

In the Complainant's Exhibit "American Champion" I find a bearing for the wheel and axle, which consists of a bearing box surrounding the axle, a sleeve in two parts on the axle and within said bearing box, the adjacent faces of the two-part sleeve and the interior of the box constructed to form annular grooves with oppositely inclined sides, and with a series of spherical rollers or balls in the said grooves between sleeve and box, one of the parts of the sleeve constructed with a screw-thread at its outer end whereby that screw-threaded part may be adjusted toward or from the other part of the sleeve, substantially as shown in said Wallace patent, and as particularly recited in second claim thereof.

I also find in said "American Champion" an internally screw-threading box is applied to a correspondingly external thread on one part of the sleeve, said box secured to the axle so as to revolve with it substantially the same as described in said "Wallace patent No. 1," and particularly recited in the third claim thereof. I have taken into consideration the fact that in third claim in said "Wallace patent" one part of the sleeve is said to press against the hub of the wheel, and the other or outer part to engage by an external thread with an internal thread in a box secured to the axle, whereas in said Exhibit American Champion this order is reversed—the outer part of the sleeve bears against the crank while the inner part of the sleeve is externally screw-threaded into an internally threaded boss which bears against the hub, the said boss being engaged with the hub (and practically with the axle, because the hub is fast on the axle), and therefore it is the inner part

of the sleeve which is made adjustable instead of the outer. The adjustment is made in substantially the same manner as in the Wallace patent, and it is made by a forced bearing between the fixed crank on the axle and the fixed hub on the axle, substantially as it is in the said Wallace patent No. 1.

The difference which I thus pointed out, which consists simply in reversing the order of the parts, I do not understand constitutes a material difference, but that the two are substantially the same.

For the reasons given I am, therefore, of the opinion that the said Exhibit "American Champion Bicycle" fully embodies and contains the invention described in the said "Wallace patent No. 1," and particularly recited in the second and third claims thereof.

In the Exhibit American Light Champion I find substantially the same box and same two-part sleeve and substantially the same adjustment and the same series of balls as in the said Exhibit "Champion Bicycle," and for the same reasons which I have given in regard to the latter I find the former to contain the invention described in the said "Wallace patent No. 1," and particularly recited in the second and third claims thereof.

131 "Wallace patent No. 2."

I find this patent to be for an improvement upon the invention of said "Wallace patent No. 1;" the construction of the two-part sleeve and the bearing box, with their corresponding inclined sided grooves and the series of spherical rollers in the said grooves, to be substantially the same as in the before-named "Wallace patent No. 1."

In the said "Wallace patent No. 1" the bearing box was rigidly and inadjustably secured to the arm of the front fork, but in the "Wallace patent No. 2" the box is made upon its periphery, of spherical shape, and sets in a recess in the end of the fork, within which the box has a certain amount of freedom for self-adjustment. The part of the fork in which is the recess containing the bearing box is called a "shell case." The third claim of the patent recites as the invention the combination of a ball-bearing device, of a free bearing box and its shell case. I understand said third claim of the patent to be for making the outer surface of the bearing box of a spherical shape and arranging that spherical-shape box in an enclosing shell, so that it may be supported therein, the external shape of the box and its arrangement in its case or recess being such that the box may adjust itself in the said shell or recess so as to retain its proper relative position with the balls and annular groove on the axle within it.

The box itself, it should be stated, is prevented from rotation in its shell or recess by a radial set-screw through the shell into the box, but yet so as to leave the box substantially free.

132 In both Complainant's Exhibit "American Champion" and "American Light Champion" I find the bearing box of the driving wheel to have the same spherical exterior and arranged in a case or recess in the ends of the fork in substantially the same manner as described in said "Wallace patent No. 2," and that it

accomplished the same result in substantially the same way. I am therefore of the opinion that the said two exhibits "American Champion Bicycle" and "American Light Champion Bicycle" each contains the invention described in the said "Wallace patent No. 2," and particularly recited in the second claim thereof.

Adjourned to Tuesday, August 2, 10.30 a. m.

TUESDAY, *August* 2, 1887—10 a. m.

Met pursuant to adjournment.
Parties present as before.

Q. 4. Please look at the Shire patent, No. 216,231, marked "Complainant's Exhibit Shire Patent"; also the Veeder patent, No. 252,280, marked "Complainant's Exhibit Veeder Patent"; also the Kirkpatrick patent, No. 314,142, marked "Complainant's Exhibit Kirkpatrick Patent," and state whether you are familiar with the same; also compare the mechanism therein shown and described with the saddle mechanism in the exhibits defendant's machines, pointing out their similarities and differences, especially those referred to and made the subject-matter of the claims of said patent exhibits, giving such reasons as you may desire for any opinions you may express in reference thereto.

A. I am familiar with the several patents referred to in the question.

First, the Shire patent: The invention of this patent relates
133 to improvements in velocipedes, one feature of which has special reference to the seat for the rider. This seat is of a flexible character and is suspended at its front and rear ends like a hammock. It is called in the patent a "hammock" seat, evidently from its resemblance to a hammock. The seat is made adjustable so that it may be more or less slack between its two points of suspension.

The second claim of the patent recites as the invention as follows: "In a velocipede the adjustable hammock seat J, substantially as set forth." I understand this claim to include a flexible seat for a velocipede suspended by its two ends so as to be left substantially free between the two points of support but made adjustable as to length between the same two points of support in order that more or less slack may be given to the seat between the said points.

In the Exhibit "Defendant's American Champion" I find a flexible seat supported at its rear and front ends but substantially free between the same points of support, substantially the same as shown and described in the Shire patent. In this exhibit, "Defendant's American Champion," the hammock seat is made adjustable, so that more or les slack may be given to the seat between the two points of support.

The object of adjustment of the hammock seat is to bring the rider nearer to or farther from the cranks of the driving wheel accordingly as more or less slack is given to the seat. I find in the same exhibit, "American Champion," the adjustable hammock seat of the Shire patent.

I take into consideration the fact that the adjusting devices of the said Exhibit "American Champion" differ somewhat
134 from the adjusting devices shown in the Shire patent. In the Shire patent the seat is shortened or lengthened to give the corresponding less or more slack to the seat, whereas in the Exhibit "American Champion" the rear support for the seat is made adjustable so as to be set farther from or nearer to the forward support of the seat to correspondingly diminish or increase the slack; but this I do not understand constitutes a material difference, for the fact remains that in the said Exhibit "American Champion" there is the same "adjustable hammock seat" as described in the Shire patent. I am, therefore, clearly of the opinion that the said Exhibit "American Champion" in its seat fully contains the invention described in the Shire patent, and particularly recited in the second claim thereof.

In the Exhibit "American Light Champion" I find the construction, arrangement, and adjustment of the seat to be the same as that in the "American Champion," and it, therefore, for the reasons I have already given, in my opinion, contains the invention described in the Shire patent and recited in the second claim thereof.

In Complainant's Exhibit "American Ideal" Bicycle and in Complainant's Exhibit "American Ideal" Tricycle I find like seats, each being a flexible seat supported at its rear and forward ends, the points of support being adjustable to increase or diminish the slack in the seat.

Understanding, as I have before stated, that the devices by which the slack of the seat may be adjusted are immaterial to the Shire patent, but that any means whereby the extent of slack in the seat may be adjusted is an equivalent for the adjusting device shown in the said Shire patent, and from the fact that in the said Exhibits "American Ideal" Bicycle and "American Ideal" Tricycle I
135 find the "adjustable hammock seat" J of the Shire patent, I am of the opinion that the said two last-mentioned exhibits contain the invention of the said Shire patent as recited in the second claim thereof.

Second, the Veeder patent.: The invention of this patent relates to seats for velocipedes. The seat is of the hammock character of the Shire patent. Parts of the invention relate specially to the mechanism for adjusting the seat, to give it more or less slack. The seat is suspended upon springs at the front and rear ends, the springs being so disconnected that one may be moved toward or from the other to give correspondingly more or less slack to the seat.

Between the two parts of the support for the seat an adjusting screw is introduced, by turning which in one direction the supporting points will be separated or, turning it in the opposite direction, will be permitted to approach each other.

I understand the first claim of the Veeder patent to be for a flexible or "hammock seat," supported at its front and rear ends upon springs, which said springs or supports are made adjustable toward or from each other; and I understand the second claim of the patent

to be for the same hammock seat with two supports for the respective ends of the seat, the said supports connected, with an adjusting screw between them, whereby said supports may be forced asunder to lessen the slack of the seat or permitted to approach each other to increase the slack of the seat.

In the two exhibits, "American Champion" Bicycle and "American Light Champion" Bicycle, I find the flexible seat supported at both ends upon springs, one of said springs being adjustable with relation to the other, whereby the said springs form a support for the seat in two parts and made extensible, substantially as described in the said Veeder patent. It is true the means for adjusting the two-part support of the seat differ from the devices for that purpose described in the said Veeder patent, but I do not understand the adjusting devices to be essential to the first claim of the Veeder patent, except that there shall be some adjustment between the two parts of the seat support. I am, therefore, of the opinion that the said two exhibits, "American Champion" and "American Light Champion" in their seats contain the invention described in the said Veeder patent, and particularly recited in the first claim thereof.

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In the two exhibits, "American Ideal" Bicycle and "American Ideal" Tricycle, I find the same flexible seat of the Veeder patent, with a support for the seat made in two parts, the said two parts extensible, substantially as in the Veeder patent; and I also find in the said two last-mentioned exhibits that the said two parts are connected together and have combined therewith an adjusting bolt, whereby the seat-supporting points of the two parts may be forced asunder or permitted to approach each other, substantially as described in the said Veeder patent.

I am, therefore, of the opinion that the said two exhibits, "American Ideal" Bicycle and "American Ideal" Tricycle, contain the inventions described in the said Veeder patent, and particularly recited in the first and second claim- thereof.

Third, the Kirkpatrick patent: The invention of this, like that of the preceding, patent relates to improvements in flexible seats for velocipedes, the object of one part of the invention being to give elasticity to the support of the front and rear of the seat. This is accomplished by the arrangement of two independent springs, one for the front end and the other for the rear end of the seat, the said springs being secured, independently of each other, to the backbone of the machine.

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The first claim of the patent is for the combination of two independent springs with the backbone of a velocipede, the said springs being secured to the backbone with a flexible seat suspended from said springs at its front and rear.

In the two exhibits, "American Champion" Bicycle and "American Light Champion" Bicycle, I find "the combination, with the perch or backbone of a bicycle, * * * of independent front and rear springs secured to said perch or backbone and a flexible seat suspended directly from said springs at the front and rear respectively, substantially as set forth" in the said Kirkpatrick patent.

I am therefore of the opinion that the said two last-mentioned exhibits contain the invention described in said Kirkpatrick patent, and particularly recited in the first claim thereof.

Q. 5. Please look at the Latta patent, No. 323,162, marked "Complainant's Exhibit Latta Patent;" also at the Benham patent, No. 310,776, marked "Complainant's Exhibit Benham Patent," and state whether you are familiar with them, and compare the devices therein shown and described with corresponding devices in the machine exhibits "Complainant's Exhibits of Defendant's Machines," pointing out their similarities and differences, especially so far as said mechanisms are made the subject-matter of the claims of said patents?

A. I am familiar with the patents referred to in the question.

First, the Latta patent: The invention of this patent re-
138 lates to improvements in the pedals applied to the arms of the driving-wheel cranks. These pedals consist of a frame arranged to revolve freely on the crank arm, and in the frame two foot bearings are arranged, one each side the crank arm and substantially parallel therewith. The said foot bearings are called pedal bars in the patent and are said to be made of India rubber. The said bars are four-sided in cross-section and are secured in place by rods extending through them and into the ends of the frame. The said bars are constructed upon their sides with a longitudinal central groove, so as to leave a foot-bearing surface each side of said groove. This peculiar feature of the pedal bar is made the subject of the second claim in the following words: "The combination, with the pedal frame, of a rubber pedal bar, H, provided with a central longitudinal groove, *h*, and two bearing surfaces *h' h'* on opposite sides of the groove *h*, substantially as set forth."

I understand the said second claim to include the said peculiarly constructed pedal bar, irrespective of the means by which the said pedal bar is supported in the frame.

The third claim of the patent is for the combination of the same pedal bar and frame, with a rod extending through the said frame and pedal bar and so as to form a support for the rod.

In the two exhibits, "American Champion" and "American Light Champion," I find pedals having bars to receive the foot, the said bars made of India rubber, the bearing sides having a longitudinal central groove, leaving two bearing surfaces for the foot on opposite sides of the said groove, and the said pedal bars supported by a rod centrally through them, whereby the said pedal bar is adapted to receive the pressure and be compressed on opposite sides of the said rod, substantially as described in the said Latta patent.

139 The pedal bars in the said two exhibits having the same longitudinal groove, *h*, and forming the same two bearing surfaces, *h' h'*, as described in the said Latta patent, and as particularly recited in the second claim thereof, I am of the opinion that the said two exhibits contain the said invention as described and recited in the said second claim of the Latta patent.

For the reason that the said pedals of the said two exhibits

have the same peculiarly formed pedal bars of the Latta patent, supported upon a rod centrally through them, whereby the pressure of the foot is brought upon the bars each side their respective supporting rods, as described in the said Latta patent. I find in the said two exhibits, "American Champion" and "American Light Champion," the invention described in the said Latta patent, and particularly recited in the third claim thereof.

Second, the Benham patent: The invention of this patent relates to improvements in the attachment of the handle or steering bar to velocipedes, the object being, as I understand it, to make the bar in a single continuous piece or undivided in contradistinction to a bar made in two parts, one part screwed into one side of the steering head and the other part screwed into the other side of the steering head.

In the patent the steering head is constructed with an open slot at its upper end, the slot being transversely across the head, the said slot being adapted to receive the one-part handle bar, which is set into the open slot in a central position. To secure the bar in the slot of the steering head a sleeve is applied at each end of the slot to embrace both the handle bar and the end portions of the slotted part of the head and so as to firmly secure the bar in place.

140 The sleeves or bar-securing devices are, in one illustration, made to screw onto the ends of the slotted portion of the steering head, said sleeves also surrounding the handle bar. In another illustration the sleeves are screw-threaded onto the handle and so as to enter corresponding recesses in the respective ends of the slotted portion of the steering head. After describing the modifications in the securing devices the inventor states: "It is obvious that other modifications in form may be made without departing from my invention, and I do not wish to be limited strictly to the forms shown." The feature of the invention which I have last described is made the subject of the first claim as follows: "The combination of an undivided bar and an open-slotted lug and two sleeve nuts or their equivalents, one on either side the lug, surrounding the bar and adapted to lock it rigidly to the lug, essentially as set forth."

In the Exhibit- "American Champion," "American Light Champion," and "American Ideal" Bicycle I find the steering head of each is constructed with a transverse open slot, with an undivided handle bar set therein, combined with clips or clamps adapted to embrace the said handle bar and both ends of the slot, substantially as described in the said Benham patent, the said clips being clear mechanical equivalents for the sleeve-like devices described in the patent.

I am, therefore, of the opinion that the said trace exhibits, "American Champion," "American Light Champion," and "American Ideal Bicycle," contain the invention of the said Benham patent particularly recited in the first claim thereof.

The said Benham patent also describes a device by which the handle bar may be centrally located in the said slot so as to extend equally each side the steering head.

141 This device consists of a projection on the bar and a corresponding recess in the slot into which the said projection (called "detent" in the patent) will set and locate the bar.

The said locating device is made the subject of the third claim as follows: "In combination with the handle bar B the detent D, constructed and adapted to operate substantially as and for the purpose set forth." I understand this claim to be not necessarily limited to making the projection on the bar and recess in the slot, as, in the words of the patent, "it is obvious that other modifications may be made"—substantial equivalents therefor—it only being essential that there shall be some engaging device between the bar and steering head which will centrally locate the handle bar.

In the said three exhibits mentioned in this answer the slot in the steering head which receives the handle bar is provided with a projection and the bar with a corresponding recess, so that when the bar is set into the slot the said projection and recess so engage the steering head and handle bar as to centrally locate the handle bar in the steering head and maintain the handle in such central position.

The device for locating the bar in the said three exhibits differs from that described in the Benham patent only in reversing the order of the locating devices; but this I do not understand to be an essential difference, but that, on the contrary, the one is a clear mechanical equivalent for the other, accomplishing the same result by substantially the same means.

For the reasons given I am of the opinion that the said three exhibits, "American Champion," "American Light Champion,"
142 and "American Ideal Bicycle," contain the invention described in the said Benham patent, and particularly recited in the third claim thereof.

Q. 6. Please look at the Moran patent, No. 245,542, marked "Complainant's Exhibit Moran Handle Patent," and state whether you are familiar with the same; also compare the mechanisms therein shown and described with the handle mechanisms of the "Complainant's Exhibit Defendant's American Ideal Bicycle," pointing out their similarities and differences.

A. I am familiar with the patent in question. The invention therein described relates to improvements in the handles applied to the ends of the steering bar, and having for its object to counteract the jar on the hands of the rider, and also to form cushions which will strike or receive the force of the machine in falling, thereby preventing to a great extent injury which would occur to the machine with hard, unyielding handles.

To accomplish the object of the invention each handle is made to terminate in an India-rubber tip, of ball shape, and from this ball-shaped end or tip an extension or sleeve of India rubber is made from the tip onto the handle so as to be grasped by the rider, thus making an India-rubber cushion between his hands and the bar.

The first claim of the patent describes as the invention "the handle of a velocipede provided with rubber ends." The second claim describes as the invention the handle of a velocipede having

rubber tips with sleeves extending therefrom onto the handles, whether or not the sleeves are made separate from the tips. The third claim of the patent describes as the invention a rubber handle, consisting of a ball to form the end of the handle, with a neck integral therewith extending on through the handle bar.

143 In the Exhibit "American Ideal Bicycle" I find a handle bar terminating at each end in rubber tips, and I also find the handle terminating in rubber tips sleeved upon the bar. I also find a handle bar having rubber handles, consisting of a ball-shaped tip, with a neck integral therewith extending onto the bar. For these reasons I find in the said Exhibit American Ideal Bicycle the invention described in the said Moran patent, and particularly recited in the first, second, and third claims thereof.

Adjourned at 1 p. m. until 2 p. m.

Resumed at 2 p. m., pursuant to adjournment.

Q. 7. Please look at the Whitehead patent, No. 194,980, marked "Complainant's Exhibit Whitehead Patent," and compare the devices therein shown and described, so far as it relates to the balance gear and its connections, with the corresponding mechanisms in "Complainant's Exhibit Defendant's Ideal Tricycle," and state whether the balance gear in the said defendant's machine has two wheels abreast with differing speeds or curves, pointing out the similarities and differences especially as to such mechanisms as are made the subject-matter of the second and third claims of said patent, giving your reasons for such opinions as you may express.

A. The patent in question describes certain improvements in that class of velocipedes in which there are two driving wheels arranged upon the opposite ends of an axle. In such a machine, so long as it is propelled in a straight path, the two wheels will revolve alike; but when turning a curve one wheel—that is, the outer wheel—must revolve faster than the inner wheel, because the distance to be traveled by the outer wheel on such curve is greater than that to be traveled by the inner wheel.

144 At the date of the Whitehead patent it was a common practice to make one wheel fast to the axle and the other loose thereon, so that the power would be actually applied to one wheel, the other wheel being free to revolve with or independent of the driving wheel, according to circumstances.

The object of the Whitehead patent was to make both wheels driving wheels, yet permit of their independent movement, one of the other, to adapt them to turn curves and yet both be driven while turning such curves.

To accomplish the independent driving of the two wheels each wheel is arranged upon axles concentric with each other, but so independent, one of the other, that either may revolve upon its own axis. Each of the two wheels is provided with a concentric gear, represented as bevel gears, of like size, and facing each other. Between the two bevel gears so fixed to each of the wheels a master wheel is arranged to revolve upon an axis concentric with the axis

of the gears, which are so fixed to the respective wheels as to revolve with them. The said master wheel is adapted to revolve upon its own axis, and is caused so to revolve by means of crank pedals in connection with said master wheel, so that the revolution of the said crank pedals will impart corresponding revolution to the said master wheel.

The master wheel carried a beveled pinion or gear arranged upon an axis at right angles to the axis of the master wheel and of the driving wheels. This bevel gear of the master wheel stands between and works into the two bevel gears of the driving wheels. The bevel gear of the master wheel revolves with the master wheel around the axis of the master wheel, and is also permitted to
145 revolve upon its own axis, so that the said bevel gear of the master wheel stands as a connection between the two gears of the driving wheels, and so that as the master wheel is caused to revolve the said bevel gear of the master wheel engages both the gears of the driving wheels, and because of such engagement will cause the two driving wheels to revolve with the master wheel. If the movement of the machine be in a straight path, so that the revolution of the two driving wheels is alike, the bevel gear of the master wheel will remain stationary on its own axis, as if it were a rigid bar in the master wheel interlocked with the two gears of the driving wheels; but if, on the contrary, the movement of the machine be in a curved path, so that one driving wheel revolves faster than the other, then the gear of the master wheel will revolve upon its own axis to the extent of the difference in velocity required for the two driving wheels, but it still makes the same connection between the two gears of the driving wheels and the master wheel, so that the revolution of the master wheel imparts the power applied to both the driving wheels; and this result is irrespective of whether the curve be to the right or left.

To the better adapt this master wheel and intermediate gearing (which is commonly called balanced gearing) to the use of the foot pedals the pedals are arranged forward of the master wheel and carry a gear combined with intermediate gearing, which works into the master wheel, so that the revolution of the distant cranks is imparted to the master wheel and thence to both the driving wheels.

As represented in the patent, the balance gear is arranged midway between the driving wheels. The axle is represented as made in two parts, each part carrying one of the driving wheels.
146 I understand the invention recited in the said second claim of the said Whitehead patent to be for a velocipede in which the two driving wheels are arranged to revolve upon axis independent of each other, but concentric or in the same axial line, combined with a gear, concentric on each wheel, the gear of each wheel being rigidly fixed thereto, with a master wheel arranged to revolve upon an axis concentric with the axis of the driving wheels and their respective gears, and a pinion or gear carried by said master wheel, but on an axis independent of the axis of the master wheel, the said master-wheel pinion or gear arranged to work into

both the gears of the driving wheel and form a connection between the two driving-wheel gears, whereby the rotation of the master wheel will be imparted to both the driving wheels irrespective of the fact whether one of the said driving wheels revolves faster or slower than the other, or whether they both revolve alike.

I understand the invention of the third claim to be for the combination of the elements of the second claim with foot pedals distant from the said master wheel, with connection from the said foot pedals to the master wheel, whereby the revolution of the foot pedals under the action of the feet of the rider will be imparted to the said master wheel and thence to the driving wheels.

In the Exhibit "Ideal" Tricycle I find two driving wheels arranged to revolve upon axis, independent of each other, but in the same axial line. The axle of one wheel extends across the machine, the said one wheel being fast thereon; the second wheel is loose upon the same axle, but so as to maintain its independence in revolution as upon its own independent axis. The axle has a gear fixed upon it, and the second wheel has an internal gear fixed
147 upon it, surrounding the gear of the other wheel and concentric with it, so that one wheel is provided with a fixed external gear and the other wheel is provided with a fixed internal gear. Loose upon the axle is a master wheel, which carries a pinion or gear upon an axis eccentrically fixed to the said master wheel and between the external gear of one of the driving wheels and the internal gear of the other driving wheel, the said gear of the master wheel meshing or working into the teeth of both the driving-wheel gears and so as to form a connection between the two driving-wheel gears and the same master wheel, and so that as the master wheel revolves its revolution will be communicated through their respective gears to both the driving wheels, and because of the independence of the two driving-wheel gears of each other and of the arrangement of the master-wheel gear upon its own axis between the two driving-wheel gears the two driving wheels are permitted the differential revolution necessary in turning a curve without losing connection with the driving power, substantially as described in the said Whitehead patent.

I take into consideration the fact that the driving-wheel gears of the patent are both bevel gears and that the intermediate or connecting gear of the master wheel is a like bevel gear, whereas in the Exhibit "Ideal" Tricycle the gears are what are called "spur" gears, but such gears are well-known equivalents for the bevel gears, and the bevel gears and spur gears under both arrangements accomplish the same results in substantially the same way.

I therefore do not understand that simply the substitution of spur gears in the "Ideal" tricycle for the bevel gears of the patent constitutes an essential difference, but that the two devices of balance gearing are substantially alike.

148 I find in said Exhibit "Ideal" Tricycle the invention described in said Whitehead patent, and particularly recited in the second claim thereof.

In the said Exhibit "Ideal" Tricycle I find the crank pedals

arranged distant from the master wheel and carrying a "sprocket wheel," and the master wheel is provided with a like "sprocket wheel." Around the two "sprocket wheels" is a chain band or "drive chain," which communicates the revolution of the pedal cranks to the master wheel and thence to the driving wheels.

The "sprocket wheels" and endless chain are and were at the time of the Whitehead invention a well-known equivalent and substitute for a succession of *y*ears to communicate rotation from one shaft to another shaft distant therefrom.

For the reason, therefore, that the said Exhibit "Ideal" Tricycle employs a well-known equivalent for the gear wheels between the foot pedals and the master wheel described in the Whitehead patent I am of the opinion that the said exhibit contains the invention described in the said Whitehead patent and particularly recited in the third claim thereof.

Cross-examination by C. K. OFFIELD, Esq., counsel for defendants:

X Q. 8. Have you ever personally had the slightest practical experience in the manufacture, use, or sale of bicycles or tricycles?

A. I have never ridden a bicycle, never made one, or sold one, but I have bought several.

X Q. 9. Have you ever testified in any case relating to any
149 patent on bicycles or tricycles in favor of any such patent where any court has adopted or followed any theory or opinion you have expressed?

A. Yes, sir; several.

X Q. 10. Identify the cases and the patents.

A. The cases were, I think, from 1878 to 1880. My testimony was given in these cases in New York city, but I do not recall the titles of the cases or the patents, except as to one patent known as the Lallement patent. There were other patents involved, but I cannot recall them.

X Q. 11. You are quite certain those cases related to bicycles and tricycles, are you not?

A. I think so; possibly only to bicycles.

X Q. 12. Who were the counsel in those cases, and did those cases not refer to a toy velocipede for children?

A. Charles F. Blake was counsel for complainants. I do not recollect who was counsel for defendants nor that any particular class of bicycles was involved.

X Q. 13. Were the cases argued before the Federal court in New York and an opinion given?

A. I only know from information. Mr. Blake informed me that he had argued the cases and that the parties were enjoined.

X Q. 14. But you don't know whether there was any defense or contest or not?

A. I recollect distinctly that there was a very strong defense made, for I was called upon to answer that defense.

X Q. 15. Do you remember whether the decrees in the cases in favor of complainant were entered by consent?

A. I know nothing about it, but never so understood it.

150 X Q. 16. Did you ever see the decree or opinion of the court in any of those cases?

A. I do not recollect.

X Q. 17. Before giving your deposition as above did you examine into the state of the art relating to the various patents you have discussed as such state of the art existed in the United States Patent Office or in English, French, or German patents prior to the dates, respectively, of the several patents?

A. I have, as I have testified several times, examined the state of the art on this subject, but not with special reference to this case.

X Q. 18. Before giving your testimony in this case did you make any examination into the state of the art as existing prior to the respective dates of these several patents, so that you could give an opinion as to the extent and scope of said patents and intelligently compare the same with defendant's structures in evidence?

A. Not with special reference to this case, but I think my familiarity with the art has enabled me to so intelligently make the comparisons that the court will have little difficulty in ascertaining my opinions upon the questions which have been presented to me in this case.

X Q. 19. Do you think that you, as an expert, can express an opinion as to the construction, validity, or scope of any letters patent or an opinion as to whether or not the mechanical devices shown you come under or within the claims of such letters patent without you know fully and exactly the antecedent state of the art relating to such letters patent?

A. I do not wish to be understood as having testified upon the question of the validity of the patents involved in this case,

151 as that is not a matter within my province as an expert, but upon the questions on which I have expressed an opinion I think my knowledge of the state of the art fully warrants my conclusions.

X Q. 20. You have not intended, then, to express an opinion to the effect that any of the letters patent shown you are good and valid letters patent?

A. I have not been asked that question, nor would I feel it proper for me to answer the question if asked.

X Q. 21. Has your knowledge of the prior art directed or assisted you in any manner in formulating your opinions relating to each of the patents presented to you and to defendants' mechanisms presented therewith?

A. Doubtless it has.

X Q. 22. Please explain to the court in what manner your knowledge of the prior art has affected or directed the opinions you have expressed.

A. I do not know that it has directed or affected them. It may have assisted me in the facility with which it enabled me to consider the subject, but to what extent and in what way it is impossible for me to state. It is the education which the art has given me that has enabled me to consider the subjects intelligently. In just what

way such education operates upon a mind of ordinary intelligence it is impossible to state.

X Q. 23. You have just testified that your knowledge of the prior art has assisted you in formulating your opinions expressed as to these patents and as to defendants' mechanisms in connection therewith. Do you now mean to state to the court that you cannot tell in what manner your knowledge of the prior art has assisted you or what influence such knowledge has had in formulating your expressed opinions?

152 A. I did not say it had positively, but that it undoubtedly would have some effect in assisting me in the consideration of the several subjects. I think the court will understand what I mean without further explanation on that subject on my part, as, if it cannot, I cannot more fully explain what I do mean.

X Q. 24. I am trying to get at approximately the value to be attached to your opinions, and, as illustrative of this effort, we will take, first, "Complainant's Exhibit Peters Patent," and I will ask you what you understand to be the prior art as to this patent which in any manner has assisted you in formulating the opinions you have expressed.

A. I think my answer wherein I described what I understood to be the invention of the said Peters patent, as recited in the second claim, gives all the state of the art bearing upon this subject which would tend to qualify that claim, as I there recognized the fact that anti-friction journal bearings consisting of a series of rollers were well known at the date of said Peters patent, and that, therefore, under no circumstances is the Peters patent to be understood to claim, broadly, such a general bearing, and that, in view of that art, the said second claim should be understood as I have described it.

X Q. 25. And what you have just described constitutes your knowledge of the state of the art prior to the Peters patent, on which your opinion is based, does it?

Ans. It does not indicate the extent of my knowledge of the art of journal bearings, but indicates sufficiently for *use* to have, I think, intelligently given my opinion regarding the invention of the second claim of that patent.

X Q. 26. In your opinion the loose hardened spheres in the defendants' device are the same thing as the rollers confined in the cage of the Peters patent, are they not?

153 A. I have said nothing about the "cage" of the Peters patent, as that forms no part or element of the said second claim.

X Q. 27. Do you consider yourself competent and within the province of your duty, as an expert, to construe the claims of a patent and state what is and what is not an element of the claim?

A. I simply answered your question and gave my reason therefor.

X Q. 28. Well, in your opinion, are the hardened balls or spheres

of the defendant's device the mechanical equivalents of the rollers in the Peters patent?

A. In my opinion they are, as I have described.

X Q. 29. How long, approximately, did it take you to make up your mind to that effect?

A. Believing myself to be a man of moderate intelligence, I do not think I was any great length of time in coming to that conclusion, for I recollect distinctly when the Peters patent was first submitted to me, with substantially the same question as the preceding X Q. 28, I read the patent and at once answered yes.

X Q. 30. The second claim of the Peters patent is a combination claim, is it not?

A. It is for a combination of elements.

X Q. 31. Please identify by letter or figure every element of that combination.

A. The elements mentioned are the axle arm of the beveled shoulder F and the beveled nut G or its equivalent, the said bevels being adapted to receive the bearing points of the anti-friction rollers. The elements are not lettered in the patent other than as I have mentioned, the claim referring directly to Fig. 4.

X Q. 32. What do you understand by the term "the bearings" as appears in this second claim?

154 A. The axle arm, called in the patent the "spindle or bearing of the axle."

X Q. 33. Isn't that lettered or otherwise identified in the patent?

A. It is only shown in Fig. 4 and is not lettered.

X Q. 34. What significance do you attach to the dictation of the claim to the effect that these parts are constructed as shown in Fig. 4?

A. That the two bevels on the axle shall be in opposite directions and so as to form an annular groove around the axle, the opposite sides of the groove diverging radially from the axle and so that the rollers may ride upon the said beveled sides of the groove, as clearly indicated in said "Fig. 4."

X Q. 35. Giving to claim 2 the elements which you attribute to it, do you find such claim represents a useful or effective combination for any purpose whatever?

A. I have said that, in my opinion, the bearings in the several exhibits of defendant's manufacture clearly contain the invention recited in the said claim, and, inasmuch as I doubt if at the present time a velocipede which did not have such bearings would be considered a good machine, I am of the opinion that the said second claim represents a very useful and effective combination for the purpose indicated in the patent.

X Q. 36. Do you find any statement in the Peters patent to the effect that it was contemplated using it in a bicycle or tricycle?

A. I do. The specification states that the improvement is "for overcoming the friction of the bearing of all vehicles mounted on wheels." At the date of the patent bicycles and velocipedes were

very well known "vehicles mounted on wheels," and I there-
155 fore understand that the patent directly includes not only bicycles or velocipedes, but any vehicle mounted on wheels, as well as by direct statement "the journals of all revolving shafts, cylinders, and bearings of machinery."

X Q. 37. In a bicycle what portion of the machine do you describe as the vehicle as being mounted on wheels?

A. I quoted from the patent. I understand it to mean all wheeled vehicles.

X Q. 38. Do you know that at the date of the granting of the Peters patent a velocipede or bicycle was never spoken of or described or indentified as a "vehicle mounted on wheels"?

A. No, sir; I do not; but I am confident that prior to that time there are numerous patents which speak of inventions as applicable to velocipedes and other vehicles.

X Q. 39. Will you please point out to the court the precise useful effect in the Peters patent and your idea of the invention of claim 2?

A. I understand the question to mean what is the invention of the second claim of the Peters patent. Am I right?

X Q. 40. Yes; if you understand also that you are to state what utility or efficacy it performs as a mechanical device.

A. I have fully stated in my direct examination what I understand to be the invention of the said Peters patent particularly recited in the second claim, and can only refer to that statement as my answer. As to the utility I think the same answer clearly indicates that; but I will add that the annular groove formed by the two beveled surfaces serves to locate and support the rollers against movement in the direction of the axis of the axle, so that they may maintain their best working condition.

156 X Q. 41. Do you find that adjustability is any part or element of this second claim of the Peters patent?

A. Not necessarily.

X Q. 42. Do you find it intimated or suggested in any manner in the Peters patent that any other device than the rollers described and shown in that patent are to be used in giving efficacy to this second claim?

A. No, sir.

Adjourned at 5 p. m. until 10 a. m., Wednesday, August 3.

WEDNESDAY, *August* 3—10 a. m.

Met pursuant to adjournment.

Parties present as before.

X Q. 43. Do you find any bevel of any description on the spherical balls of defendant's machines?

A. The spherical balls are, in my opinion, clear equivalents for the conical-shaped ends of the anti-friction rolls.

X Q. 44. Could you put a bevel of any description on a sphere and still have it remain a sphere?

A. Please explain what you mean by "putting a bevel on a sphere."

X Q. 45. Just what I say.

A. The question is unintelligible, and I again ask what do you mean by the expression "put a bevel on a sphere" in order that I may intelligently answer the question.

X Q. 46. In the defendant's machine each and every of the nest of balls or spheres employed therein are true and exact spheres, are they not?

A. Substantially so.

157 X Q. 47. If any of them were otherwise it would practically destroy, in a short time at least, the utility and successful operation of the entire device, would it not?

A. It is necessary to a successful anti-friction roller bearing that all the rollers of the series which form the bearing should be alike. Just what the effect which one misformed roll would have upon the series I am not prepared to state.

X Q. 48. In defendant's device the contact point between the spheres in their channel of rest and travel continually changes by the slightest movement of any of the parts, does it not?

A. That is the case in all free rollers in anti-friction bearings.

X Q. 49. And the spheres of the defendant's machines constantly revolve in their confined channel, do they not—not only around the axle, but in every direction?

A. They revolve around the axle, and they revolve upon their own axes in so revolving around the axle, as must all free anti-friction rollers.

X Q. 50. Have you intended to convey the impression by this answer that there is no difference in revolution and action between the confined rolls of the Peters patent and the loose balls of the defendant's machine?

A. The rolls of the Peters patent, Fig. 4, are not confined, but are free rolls—as free as the rollers of spherical shape.

It is true that spherical rollers possess certain advantages over rollers having a length greater than their diameter, but they nevertheless perform all the functions and possess all the advantages which free rollers like the Peters patent, Fig. 4, possess when combined with the peculiar annular groove around the axle shown in

158 the said Fig. 4 of the Peters patent and made the subject of the second claim.

X Q. 51. Do you find any suggestion in the Peters patent to the effect that the rollers shown in Figs. 1 and 6 can be employed without the use of the cage shown in Fig. 2?

A. Yes, sir. The arrangement shown in Fig. 4 shows a roller substantially like Fig. 1 without a cage and in an arrangement where no cage is necessary, and in the description of specification which refers especially to that figure, as I understand it, does not indicate the use of the "cage."

X Q. 52. Then, in your opinion, referring to Fig. 4 of the Peters patent, the rolls in their travel could all crowd or bind upon one another in their travel around the axle?

A. Such is not the fact. They would crowd no more than do the rollers in the anti-friction bearings of defendant's machines.

X Q. 53. In your opinion do the rollers shown in Fig. 4 of the Peters patent touch or run against one another in the practical operation of the device?

A. They probably would touch each other to some extent.

X Q. 54. In your opinion could a practical and successfully operating device be constructed under this Peters patent where the rolls were permitted to run against each other, as you construe Fig. 4?

A. I have seen anti-friction bearings in which a series of cylindrical rollers were introduced between the axle and the box, each roller free and independent of the others, and which worked well and with entire satisfaction. Knowing this to be the fact, I
159 say decidedly that an anti-friction bearing having an annular groove around the axle, with the opposite sides of that groove beveled as in the Peters patent, with the ends of the rollers correspondingly beveled, so that the bevels of the rollers work upon the beveled sides of the groove, would be more practical and successful than in the plain cylindrical rollers which I have mentioned, and which necessarily work upon the axle directly.

X Q. 55. Do you not find in this Peters patent that the principal object of the invention, as disclosed by the specifications, is to support and keep the rollers from running against one another and thereby producing friction, and that the entire specification of the patent down to the usual description of the drawings has this object and this object only in view?

A. That is undoubtedly the object of the invention, and several ways are shown for accomplishing it. One of those ways, as I understand it, is by means of the annular groove with beveled sides and rollers having their ends correspondingly beveled so as to work therein, as in Fig. 4, and made the subject of the second claim.

X Q. 56. Do you mean by this that the construction shown by Fig. 4 of the Peters patent keeps the rollers from running against one another and thereby producing friction?

A. I do; but the specification provides for, and the second claim includes, a device which will positively prevent it, should it be necessary, to wit, that the bevels of the rollers and of the axle may be "cogged or notched," if preferred, to the smooth shoulders, so that I understand the invention shown in Fig. 4 and of the second claim to be for the beveled shoulders on the axle, whether plain or notched; but in either case what you state as the object of
160 the invention is practically accomplished without a "cage" or connection of any kind between one roll and the next.

X Q. 57. Peters was the first, so far as your knowledge of the state of the art goes, to produce an anti-friction roller device whereby the rollers were supported and prevented from running against one another, was he not?

A. I do not recollect. He does not so state in the specification, but simply states ways for doing that thing. But I do not wish to be understood that his inventions are all to be limited to the nec-

essary presence of some means which will positively do that thing, as he does not so intimate, but quite the contrary.

X Q. 58. You do find, don't you, that the whole essence and gist of the Peters patent is for the purpose of "overcoming the friction of the bearings of all vehicles mounted on wheels"?

A. I have distinctly stated to that effect, and again say I do say that the improvement was for the purpose which you have stated in the quotation.

X Q. 59. And you do know at once, as an expert, that if the long rollers of the Peters patent, in addition to their bearing contact on the axle, each had a contact against the other, "thereby producing friction," the entire object of the Peters invention would be destroyed, do you not?

A. No, sir; for such is quite contrary to the facts; and, further, your question gives an entirely wrong impression of the construction of the Peters patent, figure 4, as it conveys the idea that the rollers make their bearing or working contact on the axle instead of on the beveled shoulders of the axle against which the beveled shoulders of the rollers do work.

161 X Q. 60. And so you think, do you, that the Peters patent as to figure 4 removes the entire bearing contact between the roller and the axle?

A. Substantially; yes, sir; the working contact.

X Q. 61. And you think that the device of figure 4, after removing the contact surface between the axle and the rollers, permits the rollers to crowd up against each other and produce friction, do you?

A. I say I understand that the beveled shoulders of the axle and the corresponding beveled ends of the rollers of figure 4 of the Peters patent take the working bearing of the rollers. The rollers may substantially fill the space between the box and the axle, but not so as to take the substantial working bearing. If, however, the beveled shoulders are removed, then the rollers would stand free between the axle and box-like common cylindrical rollers, well known at the date of the Peters patent, and all the rollers free. The rubbing of the rollers against each other, of which you speak, might produce a little friction, greater than would be produced were the rollers supported without contact with each other. There would be no such crowding action as your question indicates.

X Q. 62. Do you find any suggestion in the Peters patent that the space around the axle is to be completely filled up with rollers?

A. As to Fig. 4 there is no indication of the number of rollers required or desirable.

X Q. 63. You find that Figs. 2, 3, 5, 7, and 8 of the Peters patent determine whether or not the space around the axle is to be completely or approximately filled with rollers, do you not?

A. The figures to which you have referred illustrate certain
162 devices described in the patent "to support and keep the rollers from running against one another," and are what I understand you to mean by the term "cage." In those cases the rollers do not fill the space between the axle and box, as the rollers are held from each other.

X Q. 64. Where in the Peters patent do you get your authority for stating that the bearing contact is removed between the roller and axle except as to the beveled portion? Quote from the patent.

A. I quote from the specification referring to the construction of Fig. 4, as I understand it, beginning with the sentence, eleventh line, second column, first page: "Then a corresponding beveled flange or its equivalent may be fitted to the hub or box for the beveled shoulders of the rollers to work against."

X Q. 65. And this quotation, you think, justifies your assertion that the working bearing between the roller and the axle is removed to the beveled contact surface, does it?

A. That it takes the substantial bearing; yes, sir; in connection with Fig. 4 of the drawings and the second claim.

X Q. 66. Do you consider claim 2 of the Peters patent to be a clear and well-defined claim, without ambiguity of meaning and intent?

A. I do, by its reference to Fig. 4, understand it to be a clear specification of the invention as I have stated my understanding of it in my direct examination.

Q Q. 67. Do you find anything in claim two that suggests or intimates that it relates to anti-friction devices?

A. Certainly I do. Its reference to Fig. 4 clearly does that.

X Q. 68. Do you find anything in claim 2 that relates to anti-friction devices in which a roller or ball is any element of the device?

163 A. Certainly I do in the adaptation of the annular groove formed by the two bevels on the axle being adapted to receive anti-friction rollers, whether they be spheres or of greater length than one diameter.

X Q. 69. An axle-bearing having confronting beveled faces, without roller or ball, would be described and identified exactly by this claim 2, would it not?

A. Not necessarily, unless adapted to receive anti-friction rollers in a hub or box, "as shown in Fig. 4."

X Q. 70. But axle-bearings having confronting beveled faces, without rollers or balls, and being anti-friction in this, that the beveled faces took the entire bearing contact and thus made the device anti-friction, would be identified and covered by the second claim of this letters patent, would they not?

A. I do not understand how it would be anti-friction without the rollers. Unless the axle, with its beveled shoulders, is adapted to receive rollers to take their bearing on the shoulders it would not be the invention described in the second claim, as shown in Fig. 4.

X Q. 71. I now call your attention to "Complainant's Exhibit Wallace Patent No. 1" and ask you if you have intended to give your opinion or state that the defendant's structure comes under or can be construed to come under any of the claims of this patent except claims 2 and 3.

A. I have stated that the inventions of the second and third claims are found in defendant's structures and have given my reasons therefor, but have expressed no opinion regarding the remaining claims nor did I intend to do so.

X Q. 72. Why have you not expressed an opinion as to the remaining claims?

A. Because I did not feel called upon so to do.

164 X Q. 73. You were asked to point out wherein the defendant's structure contained the devices of any of the claims, were you not, without particularizing any claims?

A. I was.

X Q. 74. Why don't you state, then, that you did not and do not find that the defendant's structure comes under any of the remaining claims of the Wallace patent No. 1?

A. Because I only understand that I was called upon to point out claims which, in my opinion, were clearly infringed by defendant's structure and not to express an opinion upon claims upon which I might have doubts of infringement.

X Q. 75. So that your effort as to these patents may be understood at this point, have you expressed any opinion as to any claim of any patent you have handled where you have had any doubt as to infringement?

A. I have pointed out in each patent, I think distinctly, which of the claim or claims were, in my opinion, clearly infringed by defendant's structures, and have expressed no opinion of such infringement upon any claim where I have had any doubt of clear infringement, and have fully given my reasons for the opinions I have expressed.

X Q. 76. Claims 2 and 3 of the Wallace patent No. 1 are, respectively, combination claims of a number of varied elements, are they not?

A. They include several elements, and may be said to be combinations of those elements.

X Q. 77. Please read each of those claims, identifying each element of the combination as identified by each letter or figure set out in the patent.

165 A. The elements recited in the said claims are not to be understood as the specific and identical things referred to by letter in the specification and drawings, but are indicated by the indefinite article. If your question means to point out in the drawings by letters elements which are included by the general or broad expressions of the claim, that I will do. Is that your wish?

X Q. 78. Kindly permit us to argue to the court whether the elements of the claims in this Wallace patent are confined to the specific and identical things or elements of the claim; and, as you have stated that each claim is a combination of elements, please read each claim as such combination is shown in the patent.

A. With this understanding I read the claims 2 and 3, indicating by letter the parts in the drawings which represent such elements. Second claim: "A one-part bearing box," such as H; second, "a two-part sleeve," such as S and S^1, arranged upon the axle; third, "a circular row of balls within said box and between bearing surfaces in the box and on either part of the sleeve," such as O O. These are the elements of the combination, but qualified by the fact that

one part of the sleeve is made adjustable toward or from the other part.

The elements forming the combination of the third claim are illustrated in the drawing by the same letters as the same elements of combination of the first claim, this combination of the third claim being otherwise qualified by construction of the parts as I have described.

X Q. 79. You seem to have omitted in your analysis of these claims to identify the adjusting devices set forth as a part of the claims, as contemplated by the question.

A. I understand from you that your last question refers
166 particularly to the adjusting devices illustrated in the patent. Of the second claim, one of the parts of the sleeve is said to be provided with a screw-thread. In the illustration the one part shown screw-threaded is the part S^1. Of the third claim a boss on the crank, not lettered, is represented as screw-threaded, corresponding to the screw-thread of one part of the sleeve. The hub B of the wheel may also be said to be an element of the combination of the third claim, as the adjustment of the sleeve is made between the hub and the boss on the crank.

X Q. 80. Do you find any such means of adjustment in any of the defendant's structures offered in evidence as you have just described as an element of claims 2 and 3 of the Wallace patent No. 1?

A. As I have stated in my direct testimony, and given, I believe, clear reasons for the statement, I do.

X Q. 81. Your idea, as I take it, of these two claims of the Wallace patent No. 1 is to the effect that the adaptation for adjustment mentioned in the patent means any and all means of desired adjustment. Is this so?

A. The elements of combination being substantially the same as that recited in the claims and the sleeve made adjustable by a screw-thread or its equivalent would be the adjustment of the second claim, as I understand it. Of the third claim, any adjustment which should be made between the crank and hub so that those two parts form the abutments for the adjustment would, as I understand it, be substantially the adjusting devices referred to in the third claim.

X Q. 82. Calling your attention now to "Complainant's Exhibit Wallace Patent No. 2," I will ask you what claim or claims of that patent you have intended to express an opinion cover the defend-
ant's structures or any of them.

167 A. I have, I think, clearly stated that I found in defendant's structures the invention recited in the third claim of that patent.

X Q. 83. Do you profess any knowledge of the state of the act prior to Wallace patent No. 2 relating to the subject-matter of the second claim thereof?

A. I believe I have some knowledge of the art bearing thereon.

X Q. 84. Do you know whether substantially the same devices as

identified by claim 3 of Wallace patent No. 2 are shown and described in both English and United States patents?

A. I am not aware of patents which show those devices prior to the invention of Wallace, but, on the contrary, believe him to be the original and first inventor thereof.

Adjourned at 1 p. m. until 2 p. m.

Resumed at 2 p. m.

X Q. 85. In your opinion, is the ball-bearing device of Wallace patent No. 2 any element of the third claim thereof?

A. I don't understand the question, for the claim is said to be for "the combination in a ball-bearing device" of certain elements. The ball-bearing device includes the ball bearing—that is, the axle with its groove, the balls, and the box with a shell case, within which the bearing box is supported, as I have stated in my direct testimony.

X Q. 86. Do I understand you that you find in either of defendant's structures the ball-bearing device described and shown in Wallace patent No. 2?

168 A. I have said that I did in my direct examination and I confidently repeat the statement, with the reasons which I have given. I mean the invention recited in the third claim of that patent.

X Q. 87. Are you familiar with the patent issued to Thomas B. Jeffery, one of the defendants in some of these cases, dated April 17, 1883, relating to the subject-matter as the third claim of Wallace patent No. 2?

A. I do not recall it by name or date and, therefore, cannot say whether I am or not.

X Q. 88. I now call your attention to "Complainant's Exhibit Shire Patent" and ask you what claim or claims of that patent you have intended to assert are to be found represented in any of defendant's structures.

A. I have said in my direct examination and I repeat that, in my opinion, defendant's machines contain the invention recited in the second claim of the Shire patent, and for the reasons I have stated.

X Q. 89. In your opinion, please identify by letter what parts formed the adjustable hammock seat J of the second claim of this patent.

A. J.

X Q. 90. Is the strap and buckle *h*, engaging with the loop *i*, any part of the adjustable hammock seat J?

A. They are represented as a means for adjusting the hammock seat J.

X Q. 91. What do you understand the words "substantially as set forth" to mean as they appear as part of claim 2, Shire patent?

A. I understand them to mean an arrangement of the seat so that it may be adjusted to give to it a greater or less slack, "so that

it is brought into close proximity to the driving wheel, thus
169 allowing a wheel of greater diameter to be used than when constructed in the ordinary manner."

I understand the words "ordinary manner," as used in the quotation which I have made from the specification, to mean a rigid seat, not adjustable as to its length, to give more or less slack—that is, bring the seat nearer to or farther from the wheel—that is, from the axle cranks—and that the said words "substantially as set forth" include and mean any means whereby the hammock seat is made so adjustable.

X Q. 92. The taking up of the slack, as you call it, if accomplished in the defendant's devices, would remove the seat still further from the driving wheel instead of bringing it into closer proximity to it, wouldn't it?

A. You evidently do not understand what I have stated, for it is in both cases giving to the seat more slack which brings the seat nearer to the wheel, and *vice versa*. In either case the taking up of the slack brings the seat further from the wheel, and increasing or letting out the slack brings the seat nearer to the wheel.

X Q. 93. Do you mean to state that it is not perfectly evident from this Shire patent that when you take out or let loose the slack of the seat J you remove this seat J just that much further from the driving wheel?

A. It is perfectly evident that "taking out the slack" and "letting loose the slack" will produce opposite results. "Taking out the slack" will raise the seat; "letting loose the slack" will lower the seat—that is to say, so that in the first case the rider will sit further from the cranks, and in the latter case will sit nearer to the cranks.

170 X Q. 94. In what manner, then, do you say that the seat J of the Shire patent may be brought in closer proximity to the driving wheel? Describe the exact manner of doing it as shown by the Shire patent.

A. I mean that by letting out the slack the seat will be lowered so that the rider will be brought nearer to the cranks, and so that by taking up the slack the rider will sit farther from the cranks, and so that the adjustment may be made to vary the distance between the seat and the cranks to accommodate the legs of the rider.

X Q. 95. Is it not perfectly evident that letting out the slack or unbuckling and loosening the buckle and strap of the saddle J of the Shire patent and lowering the seat J brings this seat in closer proximity to the rear wheel A' and removes the seat further from the driving wheel?

A. No, sir; not to a mind or ordinary intelligence.

X Q. 96. Lowering the seat J doesn't bring it in any closer proximity with the rear wheel of the Shire patent, does it?

A. It does bring the portion of the seat that locates the rider nearer to the driving wheel, as the patent states. Possibly it, at the same time, may bring the rider nearer to the rear wheel than when the seat is strained or less slack, but I think not in the particular construction shown in the patent, and upon further consideration I

say that it does not bring the seat or the rider nearer to the rear wheel by loosening the slack.

X Q. 97. Well, will the loosening of the slack bring the seat J of the Shire patent any nearer the driving wheel?

A. Yes, sir—that is, so that the rider will sit nearer the driving wheel.

171 X Q. 98. Would you kindly explain to the court how the loosening of the slack in the seat J would not bring the seat in any closer proximity to the rear wheel, but would bring it in closer proximity to the driving wheel?

A. I will, with pleasure. The seat is made adjustable at its forward end, while the rear end remains the same. Now, by slackening the seat it will drop and the rider, sitting on that seat, will bring it downward so that his body will naturally be thrown forward from the rear end further than it naturally would be when the seat was taut, and the result of that natural movement of the body takes the rider toward or nearer to the forward wheel, but certainly no nearer the rear wheel in one case than in the other.

I would here state, however, that I do not wish to be understood as indicating that if the adjustment of the seat whereby it is brought nearer to the driving wheel should, perchance, also bring the seat nearer to or farther from the rear wheel, that such fact would, in my opinion, in any way qualify the invention of the Wallace patent No. 2, and the third claim thereof, as I understand it.

X Q. 99. Does the loop *i* of the Shire patent move up and down on the spring E or is it rigidly affixed thereto?

A. It is rigidly affixed thereto or so that it has no movement up or down.

X Q. 100. When you tighten the strap on the Shire patent, with which the adjustable seat J is provided, you draw the seat forward, do you not, just so much as you tighten the strap?

A. Not to the full extent, because the seat drops under slack and rises under tightening; but it does bring the actual sitting point of the rider forward when you loosen the slack, but carries that point back when tightened.

172 X Q. 101. Did you ever hear or know of a velocipede being constructed like this Shire patent?

A. Do you refer to the seat or to the velocipede as a whole?

X Q. 102. I refer to the velocipede itself.

A. Then I do not think I ever saw a velocipede as a whole just like that of the Shire patent.

X Q. 103. Have you intended to state that the loosening or taking up of the slack in the saddle of defendant's structures has anything to do with the bicycle as a practical structure in bringing the saddle nearer to or farther from the driving wheel?

A. If your question means whether the bicycle would be a practical structure with a rigid instead of a hammock seat, then I say either are practical structures. I have never ridden a bicycle, but, in my opinion, an adjustable hammock seat of the character of the Shire patent and found in defendant's exhibit machines is at least more desirable than a rigid or unadjustable seat.

X Q. 104. Have you intended to state that the provisions appearing in the saddles of defendant's structures for securing and maintaining the shape and flexibility of the saddle and which we will include under the broad term of adjustability has any intention or design, as shown by its construction, for bringing the seat in closer proximity to the driving wheel for any such purpose as you have attributed to the Shire patent?

A. I mean to state and do state that whereas the devices for supporting the hammock seat of defendant's structures differ from the devices for supporting the seat shown in the Shire patent the adjustable character and capacity of those devices are, in my opinion, intended and specially designed for bringing the seat in a more
173 or less close proximity to the driving wheel and within the capacity of the adjustment.

X Q. 105. I now call your attention to "Complainant's Exhibit Moran Handle Patent" and ask to here again identify the claims concerning which you say any of defendant's structures infringe.

A. The three claims of the patent.

X Q. 106. Do you construe this Moran patent to be simply for a rubber handle?

A. I understand the first and second claims only require the presence of an India-rubber tip on the handle, but that the third claim includes the rubber handle and tip, forming one piece.

X Q. 107. Do you find that any of the defendant's structures contain a rubber handle in the manner and form as shown in this Moran patent?

A. I find defendant's "Ideal bicycle" to contain rubber handles and tips in the manner and form substantially shown and described in the Moran patent and claimed therein.

X Q. 108. You understand that soft rubber, in distinction from vulcanized or hard rubber, is necessary to employ the inventions of the Moran patent?

A. I understand it must be elastic or it would not accomplish the results or objects mentioned. "Hard rubber"—that is, in an elastic handle—would not accomplish the objects.

X Q. 109. It was one of the most common things in the art, long prior to the date of this Moran patent, to prevent jars, concussions, and breakages in different articles by protecting them with soft rubber at desired points, was it not?

A. India-rubber cushions, broadly considered, were used for many purposes before that time.

174 X Q. 110. Was there any invention, in your opinion, in making the handle of a velocipede of soft rubber at the time of this Moran patent?

A. If it is proper for me to answer such a question, I say I think the Moran patent defines proper subject of invention in view of the state of the art, so far as I know it, at the time of the Moran patent.

X Q. 111. Please examine again "Complainant's Exhibit Latta Patent" and identify here the claims which you find cover or relate to any of defendant's mechanisms here offered in evidence.

A. The second and third claims.

X Q. 112. Do you find in any of defendant's structures the rubber pedal bar H identified by the second and third claims of this Latta patent, or do you find something which you construe to be a mechanical equivalent of this bar?

A. In my direct examination I have intended to state that, in my opinion, the pedals of defendant's machines to which I referred were "substantially the rubber pedal bar H" of the second and third claims of the Latta patent, and gave my reasons for the opinion expressed, and I repeat the answer.

X Q. 113. Have you ever examined the file-wrapper and contents of any of these patents so as to inform yourself under what action or rulings of the Patent Office these several patents were granted?

A. I have examined some of the file-wrappers of complainant's patents herein, but cannot say with certainty which ones I have examined. I have read the contents of very many file-wrappers relating to velocipedes to obtain information indicated in the question.

175 X Q. 114. Are you familiar with English letters patent granted William Harrison under date of July 27, 1877, and numbered 2870?

A. I do not recall the patent by name or date.

X Q. 115. Does is not occur to you that claims two and three of this Latta patent are about as frivolous and devoid of invention as anything of the kind you have ever seen coming from the Patent Office?

A. I know that such a characterization of patents is a common device of defendants; but inasmuch as the invention recited in the said second and third claims of the Latta patent is clearly embodied in defendant's structures, evidently useful from the fact that it is found in defendant's machines, and novel, as far as I know, I think the question rather indicates a prejudice than an opinion, and that the terms therein expressed do not apply to the Latta patent.

Adjourned at 4.40 p. m. until 10 a. m. Thursday, August 4, 1887.

THURSDAY, *August* 4, 1887—10 a. m.

Met pursuant to adjournment.

Parties present as before.

X Q. 116. I call your attention now to "Complainant's Exhibit Benham Patent" and ask you to here identify again the claim or claims of that patent concerning which you find an analogous structure in any of defendant's devices.

A. The first and third claims.

X Q. 117. The two claims just mentioned are combination claims of old elements, are they not?

A. Possibly individual elements might be found performing some office in some structure somewhere in the art, but I am not aware of the existence of the combination of elements as recited in either claim.

176 X Q. 118. Do you find in any of defendant's devices the shoulder or detent D of the Benham patent?

A. I have said I did in my direct testimony, and for the reason there given repeat I do.

X Q. 119. Are you familiar with English letters patent issued to George Illson, No. 4606, dated November 12, 1879?

A. I do not recall it by name and number.

X Q. 120. What effect, if any, would it have upon your opinion as an expert, in your search and comparison of defendant's devices with any of the patents in question, if you should have shown you a patent existing prior to the date of the particular patent under consideration which showed and described mechanisms producing and permitting the same result as the patents you were handling in substantially the same way?

A. Should such prior patents be offered in evidence by the defendants and reasons given by their expert or other witnesses, wherein they understood the similarity mentioned in the question to exist, if I cannot then answer such testimony and patents to show them to be different substantially from complainant's patents herein it will be because I am satisfied that complainant's claims under such patents have been honestly answered.

X Q. 121. Under what conditions of facts, if ever, do you feel yourself bound as an expert to confine the patent which you are handling to the specific devices shown in that patent?

A. That is a question which I cannot answer without some particular patent is mentioned. In all cases I intend to, and believe I do, express an honest opinion upon questions submitted to me under examination, and if I cannot honestly find infringements I never yet have failed to say so.

177 X Q. 122. Question re-read, and the witness is asked to state what possible difficulty there can be in answering the question that he neglects or refuses to answer it.

A. I think the question speaks for itself, and I repeat my answer.

X Q. 123. Have you ever testified in any patent case where you felt yourself obligated in your testimony to confine the patentee to the specific devices mentioned in the patent?

A. I do not recall such a case if by "specific" you mean to exclude equivalents.

X Q. 124. I call your attention now to "Complainant's Exhibit Veeder Patent" and request you at this point to identify the claims in that patent which you say defendants infringe in any of their structures.

A. The first and second claims.

X Q. 125. The supporting of a leather saddle seat upon springs at the front and rear of the saddle was old at the date of the Veeder patent, was it not?

A. I am not aware that a spring made in two parts had been used to support the two ends of a flexible saddle prior to the Veeder invention, but I am aware that, as the patent states, a spring had been used to support the flexible saddle of a bicycle prior to the Veeder patent, as in the Shire patent.

X Q. 126. Both springs of the Veeder patent are under springs and are so provided in the patent, are they not?

A. The two parts are elastic and evidently form a spring for each end of the flexible saddle and are located beneath the saddle.

X Q. 127. How many springs do you find supporting the saddle in defendant's device?

178 A. Two; one at the front and one at the rear.

X Q. 128. Is the spring at the pommel end of defendant's saddle an under spring or an end spring?

A. It is substantially an under spring; it has two arms, one of which is directly under the forward end of the saddle and rests upon the backbone; the other arm extends up, and the forward end of the saddle is hung to it.

X Q. 129. Is there any connection between these two springs in defendant's device?

A. There is; the backbone makes a positive connection between the two and upon which the rear spring is made adjustable.

X Q. 130. As an illustration, then, of your conception of a mechanical equivalent, do you find the backbone of defendant's device to be the connecting link so as to bring the defendant's device under the claim of the Veeder patent for a spring made in two parts?

A. I said defendant's machines embody the firsst claim of the Veeder patent, because the flexible saddle is supported upon springs which are in two parts. The backbone connects those parts and may properly be considered a third part, in which case the spring is composed, as the first claim states, of two or more parts. I understand it to be immaterial what is the arrangement of the springs, provided always that they are made separate and support the flexible seat at its respective ends, and that the said springs are in some manner made adjustable toward or from each other.

X Q. 131. Have you ever read the file-wrapper and contents of this Veeder patent and studied the patents therein cited by the Patent Office?

A. I do not recollect whether I have or not.

179 X Q. 132. Examine again the "Complainant's Exhibit Kirkpatrick Patent" and identify how many of the claims of that patent you are of the opinion defendants infringe.

A. The first.

X Q. 133. This first claim is a combination claim of old elements, is it not?

A. Broadly considered, yes, sir.

X Q. 134. The springs supporting the front and the rear of the saddle of the Kirkpatrick patent are particular and peculiar springs, and are therein so described and claimed, are they not?

A. They exhibit certain peculiarities; which peculiarities are made the special subject of several of the claims.

X Q. 135. The two springs of this Kirkpatrick patent are distinct, independent, and separate springs, are they not?

A. They are independent in the sense of being separate, but they coact when applied to the machine.

X Q. 136. So far as form and mechanical construction are concerned, you find no such springs as are exhibited in this Kirkpatrick patent in any of defendant's devices, do you?

A. I do find in defendant's machine substantially the saddle springs of the Kirkpatrick patent recited in the first claim, but I do not find the peculiarities of construction made the subject of the remaining claims.

X Q. 137. There is more difference, is there not, between the springs of any of defendant's devices and the Kirkpatrick patent than there is between the springs of the Kirkpatrick and Veeder patent?

A. No, sir.

X Q. 138. I now call your attention to "Complainant's
180 Exhibit Whitehead Patent" and ask you to identify here each claim of that patent which you assert defendants infringe.

A. The second and third.

X Q. 139. Both of these claims are combinations of particular elements specified and identified in every part by letters, are they not?

A. Not all directly indicated by letter, the second claim being for a velocipede as a whole, consisting of certain elements which are indicated by letter. The third claim necessarily includes the velocipede as a whole, certain elements combined therein being particularly referred to by letter.

X Q. 140. Did you express your opinion as to this Whitehead patent and the infringement thereof by defendant's bicycle, based upon the assumption that Whitehead was the first to make both of his wheels driving wheels and yet permit of their independent movement, one of the other, to adapt them for turning curves, and yet both be driven while turning such curves?

A. No, sir; for I am aware that the two wheels had been arranged in a tricycle, to be each independently driven by its own independent crank, in which the result you mentioned is accomplished; but in that case the two wheels are not driven by a power common to both, as in defendant's bicycle, so that in this prior construction in turning a curve, if the rider applied power to both wheels, he must necessarily tread one crank fastsr than the other.

X Q. 141. To avoid an extended examination as to this Whitehead patent it is a fact, is it not, that the gist and element of the Whitehead invention is to accomplish an old result by a spe-
181 cific mechanism, carefully pointed out in his specification and made the subject-matter of the two claims of his patent, which you have handled?

A. I am not aware that prior to the Whitehead patent a velocipede having two wheels with a crank pedal for applying power through the foot of the rider was known in which the said two driving wheels were independent of each other, but connected by balance gearing, so that the power of the pedals was applied directly to both wheels, permitting a constant and regular revolution of the pedals, but yet leave the wheels so independent of each other that they might adapt themselves automatically to the differential velocities required in turning curves.

JOHN E. EARLE.

It is hereby stipulated by and between the parties hereto and their respective solicitors that the depositions of Pratt and Earle, as well as other depositions taken in behalf of either of the parties in either of the causes named below, viz:

The Pope Manufacturing Company *v.* The Gormully & Jeffery Manufacturing Company *et al.*, The Same *v.* R. Philip Gormully *et als.*, The Same *v.* R. Philip Gormully, or in any of the causes now pending in this court having the same complainant and the parties or either of them above named as defendants, in which Coburn & Thacher are complainants' solicitors and Offield & Towle are defendants' solicitors, may be used in evidence the same as if taken especially in each particular case so far as applicable to the issues therein, together with all the exhibits, stipulations, and agreements connected therewith offered by either party, subject to all objections to competency, relevancy, or materiality.

182 It is also stipulated that the exhibits and testimony taken may be kept by the parties taking the same until the testimony is closed, but that each party will furnish the other side with a copy of the testimony as it is taken, and the filing of said original depositions by the respective solicitors shall be the same as if it were regularly sealed up and forwarded by the magistrate to the court; also that all papers and exhibits offered in evidence shall be open for the inspection and examination of either party at any time, and the express charges shall be paid by the party who desires to use them.

Certificate.

I, Lewis G. Farmer, a notary public within and for the county of Suffolk, in the State and district of Massachusetts, special examiner by consent of the parties in said causes, do hereby certify that on the several days named in the depositions hereto annexed I was attended at Boston, in the said State and district of Massachusetts, by the counsel and witnesses aforesaid; that the said witnesses were duly sworn and examined and the said depositions were reduced to writing and read to the witnesses and by them subscribed in my presence, and that the exhibits referred to in said depositions were introduced in evidence in said causes during the taking of said depositions, and that said evidence was taken under and in pursuance of a notice dated and service acknowledged July 18, 1887, and hereto annexed.

[SEAL.] LEWIS G. FARMER,
Notary Public and Special Examiner.

183 I certify that my fees in said causes for taking said testimony amount to $127 50, being for eight and one-half days' services at $15 per day.

L. G. FARMER,
N. P. and Sp. Examiner.

I hereby certify that the said John E. Earle was in attendance before me as a witness for six (6) days, and that the said Charles E. Pratt was in attendance before me as a witness six (6) days.

L. G. FARMER,
N. P. and Sp. Examiner.

184 Met at the office of the Pope Manufacturing Company, No. 79 Franklin street, Boston, Massachusetts, at 10 o'clock a. m., on Monday, September 26, 1887, pursuant to stipulation between the parties; whereupon the following proceedings were had before me, Louis G. Farmer, a notary public, duly authorized to take depositions.

Present: L. L. Coburn, of the firm of Coburn & Thacher, solicitors for the complainant, and Charles K. Offield, of the firm of Offield & Towle, solicitors for the defendant.

CHARLES E. PRATT, being produced as a witness to testify in behalf of complainant in rebuttal, first being duly sworn, testified in answer to interrogatories asked him by the respective counsel as follows, to wit:

Q. 1. Have you testified in this cause?
A. I have.

Adjourned until 2.30 p. m.

Resumed at 2.30 p. m.

Q. 2. Please look at this paper now shown you and state what it is.

A. It is a letter of R. Philip Gormully, one of the defendants in this case, to the Pope Manufacturing Company, complainant, dated March 5, 1883, and received in due course of mail two or three days later.

Q. 3. Please point out to the court such clauses in said letter as indicate that Mr. Gormully understood the license then under consideration as containing the clause which would preclude him from disputing the validity of the patents therein named after he
185 should return the contract, and also state to the court what contract or contracts were then being considered.

A. The contracts being then considered were a permanent form for the special license relating to the stock purchased from Mr. Jeffery, afterwards embodied in contract No. 1, and an additional license for making youths' machines, afterwards culminating in contract No. 2.

I have pointed out the clause or clauses inquired of by enclosing the same with lead-pencil marks on pages 2 and 3 of this letter, the clauses reading as follows: "I should also wish inserted in clause 7, at the end of printed matter: 'This to remain in force only until annulled as per section 9,' as, in case I should return contract at any time, I should wish to be free to dispute any patent you may claim to cover. Again, in reading contract I do not find anywhere that

you agree to protect me from unprincipled men, who may try to make bicycles without any reference to my interests or the balance of the bicycle family. There should be a clause that you would prosecute all such offenders and pay all costs of such suits, and I think as long as I hold a license from you you should guarantee to indemnify me from any loss of such proceeding, if I should continue to pay you royalties. And again, supposing some one should successfully resist any action you take against them, then I should have all royalties allowed or rebated from the time of commencing such suit, so that *it* can be on the same footing with the unprincipled manufacturers."

Counsel for complainant offers in evidence the letter just testified about and request- that the same be marked for identification "Complainant's Exhibit Gormully Letter of March 5, 1883." (So marked.—L. G. F.)

186 Q. 4. Please look at this paper now shown you and state what it is.

A. It is a copy of a letter from the Pope Manufacturing Company to Mr. Gormully, dated March 10, 1883, and sent to him by mail in reply to his letter of March 5, just above referred to.

Q. 5. Will you point out to the court that part of this letter which replied to the part which you have above quoted from Mr. Gormully's letter with reference to his being free to dispute any patent, etc.?

A. I mark by enclosing with lead-pencil mark on the second page of this reply the following clause: "As to the clause to be added to section seventh we won't object to adding these words, but if you want it understood that you dispute any patents on returning license we cannot assent to any such understanding. The understanding we want is that you are to respect the patents and not join our enemies, if we should have any."

Counsel for complainant offers in evidence a copy of the letter last above referred to and request- that the same be marked for identification "Complainant's Exhibit Letters to Gormully of March 10, 1883." (So marked.—L. G. F.)

It is stipulated that a copy of said letter may be used in place of the original.

Q. 6. Did the Pope Manufacturing Company ever consent to the request of Mr. Gormully to be left free to dispute the patents, which request was denied in this letter of March 10; and, if not, what was the meaning of the clause of the letter written to Mr. Gormully by the Pope Manufacturing Company, bearing date May 4, 1883, which defendants have offered in evidence? I mean the clause containing the words "*in statu quo*."

187 A. No, the company did not ever consent to Mr. Gormully's request to be left free to dispute the patents whenever he should return his agreement and give up the license. When he contended for that the company refused to accede to it, as shown by the letter of March 10. I understood Mr. Gormully's letter of May

1, 1883, to refer particularly to the payment of royalties for the use of such patents as he was then stipulating about using and as were used in the machines he did make that season under his license and commenced to make before the license was signed—that is, the patent to Lallement, Hanlon and other patents referred to in this letter of May 1—and that he did not wish to be obliged to continue the payment of royalties for using the inventions after the patents should expire.

The clause in the letter to Mr. Gormully of May 4 reading: "We will also agree to let you return the contract and stand *in statu quo* substantially when the three-years or so patents expire," was written with that understanding, and meant that the Pope Company were then willing to modify the agreement by adding the words at the end of clause seventh in the printed form under consideration, which had been requested by Mr. Gormully in his letter of March 5—that is to say, that with the understanding that he was to use only certain patents with a certain class of machines, the company was willing to stipulate a date at which he might return his license and stand "*in statu quo*" with reference to those machines and patents. This clause, however, did not mean what is assumed to be the meaning of it by Mr. Gormully and his counsel in Q. 33 and answer thereto of Mr. Gormully's deposition, and Mr. Gormully must have been in error in his recollection.

188 Q. 7. Did you, as attorney or representative of the Pope Manufacturing Company, ever represent to Mr. Gormully or give him to understand that he would be left free to dispute the validity of any or all the letters patent named in contract No. 2 at any time that he might discontinue the payment of royalties under it or after April 1, 1886?

A. No, I never did; and all the representations or understandings in reference to the subject-matter of that contract to which there was any mutual assent were carefully and at considerable length written down and inserted in it by Mr. Gormully and me together before it was signed, so that there might be no dispute afterwards, as the long inserts in contract No. 2, under clause ninth, show.

Q. 28. What is this paper now shown you?

A. It is a letter from Mr. Gormully, defendant, to The Pope Manufacturing Company, complainant, dated October 29, 1884, and received by the company in due couse of mail.

Counsel for complainant offers in evidence the letter just shown the witness and requests the same be marked for identification "Complainant's Exhibit Gormully's Letter of October 29, 1884."

Q. 29. Point out to the court anything there may be in said letter suggesting that the license then being considered might be substantially the same as the license, which he then had; also state which license contracts are therein referred to.

A. I enclose with a lead-pencil mark on the second page of this letter the following words: "I still think there is a lot of unneces-

sary verbiage and cannot quite see the drift of it, and cer-
189 tainly if of no use, why not just add a memorandum to *pre-*
vent license and thus affect the arrangement without this new form." The present license referred to was the one dated 13th June, 1883, and marked contract No. 2 in this case, and the form referred to was a preliminary draft for consideration in negotiating the license of December 1, 1884, marked contract No. 3.

Q. 30. What is this paper now shown you?

A. It is a copy of a letter from The Pope Manufacturing Company, complainant, to Mr. Gormully, the defendant, dated November 4, 1884, and mailed to him on or about that date in reply to his letter 29th October, 1884.

Counsel for complainant offers in evidence the paper above referred to and requests that the same be marked for identification "Complainant's Exhibit Letter to Gormully of November 4, 1884."

Q. 31. Please point out to the court what reply was made in said letter, if any, in reference to the form of the new license contract.

A. I enclose with pencil-mark on the first page of this copy the following words: "We cannot simply extend your present contract as you suggest, because that will not be satisfactory to us and will not secure our interests. We cannot give you a license to make bicycles with hollow forks and ball bearings, etc., to compete with the English machines in the market, nor to make racing machines."

Q 32. Was there anything written or said by you or the Pope Manufacturing Company which would give Gormully to understand that he would be at liberty to dispute the validity of the patents named in contract No. 3 after he should discontinue the payment of royalties notwitstanding the terms of the contract to the contrary; if so, what was it?

190 A. No; there was nothing of that kind.

Q. 33. Was there anything in contract No. 4 which was meant to give Mr. Gormully the right to make or to continue to make any machines containing any of the devices of the patents of the Pope Manufacturing Company which had not expired without paying royalties therefor; if so, will you point it out to the court?

A. No; there was not, but, on the contrary, there was an express reservation that he should pay royalties if the construction of his machines included inventions in unexpired patents. The second clause of contract No. 4, dated 28th November, 1885, was meant to fix a date at which the royalties upon machines made under patents expiring in the first half of the year 1886 should cease to be paid, that date being a date for sales since the royalties were paid only upon the sales of machines in point of time, and to leave Mr. Gomully or his concern free to manufacture as many machines as they chose before that date to supply the market afterwards, and that date was fixed as the 1st of July, 1886. The clause of reservation is in these words: "And made only under patent- whose terms expire prior to the last-mentioned date." It being meant and understood that if machines were made with devices covered by patents whose terms continued

after that date the royalties were not remitted or rebated, but should continue to be paid.

Q. 34. What is this paper now shown you?

A. It is a letter from R. Gormully, defendant, to The Pope Manufacturing Company, complainant, dated April 23, 1883, and received by that company shortly afterward in due course of mail.

Q. 35. How long had negotiations then been going on between the Pope company and Gormully in reference to the license?

191 A. several months. Mr. Gormully had written the company on the 15th November, 1882, asking for the terms of a license.

Counsel for complainant offers in evidence the letter of Mr. Gormully of April 23, 1883, and requests the same to be marked for identification "Complainant's Exhibit Gormully Letter, April 23, 1883."

Q. 36. If you find anything in said letter to the effect that Mr. Gormully had employed experts and attorneys to investigate the patents then owned by the Pope Manufacturing Company, and had given the matter a full and thorough investigation before entering into the full license contract with the company, please point it out to the court.

A. I do find the matter inquired of on the second page of this letter and enclose it with lead-pencil marks, including the following words: "Again, when I left Boston nothing definite had been decided upon. I told you I had to think about it, and have been strongly thinking about it ever since, and have come or almost so to the conclusion as follows, after paying considerable money to experts and getting legal opinions, viz: I am morally sure the Brake mechanism as now applied does not infringe; also that Bramley & Parker's English patent (6027, A. D. 1830) anticipates bifurcated perch; also that open head and stop does not infringe as now made, the saddles and cranks are a small matter, as that is settled by expiration of Lallement patent and the rubber tire. I can use any shape except round contractile, and am not sure but what the bob-in-winder anticipates Serrell's patent. Furthermore, I am informed

192 that I can obtain in Paris information regarding the machine used by Michaux and others prior to 1867 that will upset all vital claims. I have a friend who is now on his way to Paris, whom I have instructed to get all the information at any expense, and shall shortly have it."

Adjourned to 10 a. m. September 27.

Resumed September 27, 1887.

Present as before.

Q. 37. Please look at the paper now shown you and state what it is.

A. This is a letter from Mr. Gormully to The Pope Manufacturing Company, complainant, dated November 19, 1886, and received by the company shortly after that date in due course of mail.

Q. 38. Please state what led to this letter and what was the nature of the agreement, a draft of which was enclosed in this letter of November 19, 1886.

Q. On the 19th of June, 1886, the Pope Manufacturing Company, having learned that Mr. Gormully's firm were selling machines in violation of the contracts and infringing certain patents, wrote Mr. Gormully, explicitly pointing out those matters and requesting them to desist. On the 24th of June Mr. Gormully replied that he would come East and have a conference with the company soon after the 4th of July to arrange matters for the future. That conference was postponed from time to time until about the first of November, 1886, when Mr. Gormully came to Boston and had the conference. That conference was principally about the American Champion bicycles and Ideal tricycles, which the firm of Gormully & Jeffery were making, and such machines as they might also desire to make in the future and the terms of a license under certain of the patents of the Pope Manufacturing Company to make
193 them. At that conference no license or contract was concluded, but memoranda were made by each party for private use, and Mr. Gormully returned to Chicago for further consideration of the terms of such a license which had been discussed, and this letter of November 19th was written as a result of his further consideration and to carry out the understanding with which the contract closed, that he should communicate with the company after his return. The draft of agreement referred to in the letter was one which Mr. Gormully had prepared after his return from the conference upon a printed blank form, such as the Pope Company had, and was a draft of a proposed license under that company's patents respecting all the machines then made by the firm of Gormully & Jeffery and respecting the previous contracts, providing that the latter should be terminated and that certain royalties should be paid under the patents, and certain other stipulations respecting the manufacture and sale.

Counsel for complainant offers in evidence the letter of Gormully dated November 19, 1886, and requests that the same be marked for identification "Complainant's Exhibit Gormully Letter of November 19, 1886." (And it is so marked.—L. G. F.)

Also the copy of agreement that is referred to in said letter as being inclosed, and requests that the same be marked for identification "Complainant's Exhibit Gormully's Proposed New License." (And it is so marked.—L. G. F.) Objected to as incompetent and not proper examination in rebuttal and such papers not being the entire record of the alleged transaction.

Q. 39. Please look at this paper just offered in evidence and state what it is.

194 A. It is the draft of license and agreement received by the Pope Manufacturing Company and enclosed with the letter from Mr. Gormelly of the 19th November, 1886, and referred to in that letter.

Q. 40. What has been your experience which would tend to qual-

ify you to testify as an expert in matters relating to letters patent and mechanisms described in specifications and drawings of patents, and particularly matters relating to devices used in velocipedes and bicycles?

Defendant's counsel objects to this line of examination as to this witness on the closing of proofs from the party complainant as incompetent, and gives notice that if this witness attempts at this time to qualify as an expert witness in relation to the subject-matter inquired of defendants will move for time to take testimony to contradict or explain any evidence given by this witness.

A. For the past fifteen years I have been accustomed, in connection with my practice as solicitor of patents and counsel in patent causes, to examine letters patent for the purpose of giving my opinions as to the meaning, scope, and construction of the claims and devices therein and to compare them with other machines and devices with reference to questions of novelty or infringement, and I have also drawn many specifications and claims for letters patent on various machines and devices, and have often been consulted and sometimes examined as an expert in such matters. For the past nine years I have been a practical rider and user of bicycles and other velocipedes and have ridden on the roads between six and seven thousand miles and on divers such machines. For about the same length of time I have also been soliciting patents and acting as counsel and attorney in patent causes for several
195 makers and dealers and many inventors in this class of machinery, and in connection with such services have made diligent study of the letters patent and the state of the art and manufacture relating to velocipedes in this country and in England and France and elsewhere from the time of the Draisine, in 1816, to the present time.

Q. 41. Have you examined and are you familiar with the following patents:

Defendant's Exhibit Smith 1869 Bearing Patent;
Also Defendant's Exhibit Alcott 1870 Bearing Patent;
Also " " Rees 1872 " "
Also " " Vernon 1872 " "
Also " " Bailey *et al.* 1866 Bearing Patent;
Also " " Jewett 1868 " "
Also " " Gardner Jan., 1871, Bearing Patent;
Also " " White 1867 " "
Also " " Perley 1863 " "
Also " " Smith 1877 " "
Also " " Mennons 1860 " "

and are you familiar with the testimony of Thomas B. Jeffery, one of the defendant's experts, in reference to these patents and their relation to the mechanisms shown in Complainant's Exhibit Peters Patent; and, if you say you are, will you please state how the mechanisms in each of said defendant's exhibits compares with or differs

from the mechanisms in Complainant's Exhibit Peters Patent, and especially embodied in or made the subject-matter of the second claim in said patent, and give your reasons for such opinion as you may express, and also any reasons you may have in regard to your views with reference to the correctness or incorrectness of the views of the defendant's experts with reference to either or any of said defendant's exhibits containing the mechanisms of the second claim of the Peters patent?

196 A. I have examined and am familiar with the various exhibits and the testimony referred to. The devices of the Complainant's Exhibit Peters Patent inquired of constitute a wheel and axle-bearing of the general class of anti-friction roller bearings and of the specific class or variety of such bearings in which both the journal and pivot friction or the vertical and lateral thrust are borne by the same bearings or bearing contact surfaces. Of the defendant's exhibits referred to, the Smith 1869 patent and Rees 1872 patent and the Vernon 1872 patent do not belong to the general class of anti-friction roller bearings at all, but are plain cylindrical bearings, having the shoulders for keeping the wheels on the axles or journals inclined instead of perpendicular to the axis of the journals, as was the more usual and older form. As compared with the Complainant's Exhibit Peters Patent mechanism referred to in the second claim, neither of these three exhibits shows any anti-friction roller or corresponding device; but each shows a beveled or inclined shoulder on the axle or journal, operating and constructed to keep the wheel in place at one end and at a beveled or inclined shoulder on or connect with a nut on the axle or journal, operating and constructed to keep the wheel in place on the axle or journal at the outer end of the hub; and in each the hub or box is beveled or inclined inwardly at each end to correspond with and fit against the beveled or inclined shoulders on the axle, and in each the journal friction or vertical thrust is sustained upon the longitudinal cylindrical surfaces of the axle or journal and of the hub or box, and the pivot friction or lateral thrust is sustained on the inclined surfaces. These inclined shoulders on the axles or journals of the devices in these three defendant's exhibits in form resemble the inclined shoulders of the axle and nut in the mechanism of the

197 second claim in the Peters patent, but they do not perform the same work or fulfill the same functions, nor do either in the same way that they do in the mechanism referred to in the second claim of the Peters patent, in which they take both the end thrust and the vertical strain of the load and afford bearing surfaces for the beveled end of a series of anti-friction rollers.

In Defendant's Exhibit Alcott 1870 Patent is described and shown an anti-friction roller bearing of the same general class as the Peters, in that it has a series of anti-friction rollers around the axle and within the hub and interposed between the parallel cylindrical surfaces of these to sustain the vertical strain of the load and substitute rolling friction for rubbing friction in the vertical direction. In this device, however, the end thrust is not relieved by anti-friction devices, but is taken upon plain bearings of the shoulder and nut upon

the ends of the hubs, and thus the device of Alcott does not fall within the specific class or variety of the Peters device. In this Alcott device there is a vertical shoulder on the axle and a vertical shoulder on the nut, against which both the hub ends and the main anti-friction roller ends may impinge. These shoulders have small circular grooves, in which rests the ends of a series of small separating rollers placed between the main anti-friction rollers, which series of small separating rollers, in combination with the grooves and the shoulder and nut, constitute a cage to keep the main anti-friction rollers apart and in parallel position with the main bearings of the axle and hub. In this Alcott device there are shown and described slight inward bevels or incline surfaces extending from the shoulder and the nut, constructed and operating to strengthen the parts and assist in assembling, but these small inclines do
198 not do the work of the beveled shoulder and nut in the Peters patent nor operate in the same way, since they do not take either the journal or the pivot friction of the wheel or serve in any way to keep the wheel upon the axle. The main anti-friction rollers in this Alcott bearing are also slightly beveled or tapered to correspond with the thickening of the journal at the shoulder and the small tapering projection from the nut, but they do not appear to be beveled for the same purpose, and these rollers—I mean the main anti-friction rollers of the Alcott device—neither operate or co-operate with the other parts of the bearing in the same way or to do the same work as the rollers in the Peters device, since they only take the vertical strain of the load and not the end thrust, and they take and bear it throughout their cylindrical length and not upon conical surfaces at their ends, and they are not combined with and find no bearing against any conical, beveled, or inclined bearings in the hub or box.

In Defendant's Exhibit Bailly *et al.* 1866 Bearing Patent there are shown three forms of anti-friction roller bearings in which the rollers are spherical, the form shown in figure one (1) being constructed and operating to take the vertical strain upon the rollers, the form shown in figure ten being constructed to take the end thrust upon the rollers, and the form shown in figures six and seven appear to take both the vertical and end thrust upon the rollers or balls. These latter forms are constructed as journal bearings for the middle of shafts, however, and the form shown in figure ten is for a pivot bearing or step for a vertical shaft, the form shown in figure one being the only one adapted for a wheel and axle-bearing, as for a carriage.

Adjourned until 2 o'clock.

199 Resumed, 2 o'clock.

This bearing of the Bailly patent shows an axle with a perpendicular shoulder and a nut with a perpendicular face—that is, these faces on the shoulder and nut are perpendicular to the axle and do not present any beveled or inclined surfaces, as in the Peters patent. Upon the cylindrical axle end is placed a sleeve. Around

this sleeve are two pairs of grooves. One pair of grooves, being the inner ones, are for a series of small cage rollers or balls, and the other pair of grooves, being the outer ones, are for two series of anti-friction rollers or balls, which take the vertical strain of the load. The hub has an end plate bolted to each end, with inward projections or "throats" extending into the hub and furnishing the box-bearing surfaces or tracks for the anti-friction rollers. A split cylinder inside the hub and between the hub and the sleeve on the axle rests on the small cage balls, and, extending either way to the anti-friction balls and between them, serves, by the escallops in its ends, to keep the balls apart, and thus operates as a cage, since, in this device, the anti-friction rollers or balls at either end are not sufficient in number to completely fill the place around the axle and sleeve and impinge against each other, but have to be held apart.

This device of Bailly cannot be assembled or disassembled—that is to say, the wheel cannot be placed upon the axle or, having been placed there and secured, cannot be removed without disengaging and removing both the axle nut and one of the end plates of the hub. In this respect also it differs from the Peters device.

This device of Bailly, then, does not exhibit the beveled shoulder of Peters, nor the beveled nut or its equivalent, nor the construction of a fixed, undivided box with inclined or beveled surfaces for the rollers, nor the construction for conversion of both journal and pivot friction, nor the construction by which the nut and its beveled shoulder both take the bearing of the rollers and holds the wheel in place, as in the Peters patent.

Defendant's Exhibit Perley 1863 Patent shows a contrivance for an anti-friction roller-journal bearing having grooves turned in the journal and corresponding grooves turned in the journal box and several series of anti-friction rollers or balls to sustain the vertical strain and to convert the journal friction. It also shows a device for converting the friction of the end thrust of the journal, consisting in two collars, one of which is on the box end and the other on the shaft, each having semicircular grooves and a series of spherical rollers inserted between and running in the grooves, which do not sustain the vertical strain, but only the end thrust. The mechanism shown in this patent differs from the mechanism of the Peters patent, in that it does not exhibit the beveled shoulder on the axle or the beveled nut or the corresponding beveled surfaces in a cylindrical box, nor the construction whereby both the vertical and lateral strains are taken upon the same bearing surfaces.

The Defendant's Exhibit "Jewett 1868 Patent" shows and describes a car-axle box, into which the end of the fixed axle extends and has its bearing. The bearing is constructed with two grooves in the axle on the arc of a circle in cross-section equal to about one-quarter of the circle, and around each groove is a series of anti-friction rollers of spherical shape held partly in the box in grooves therein on the arc of a circle and cross-section about three-eighths of the circle, and *in* similar grooves in end plates screwed to the box are at each end. The mechanism shown in this patent differs from the mechanism shown in the Peters patent, in

that it has not the beveled shoulder or the beveled nut or the corresponding beveled surfaces in the cylindrical portion of the undivided cylinder in the hub, and it cannot be assembled or disassembled without removing both end plates from the bearing box.

The Defendant's Exhibit "Gardner January, 1871," Patent shows a castor contrivance in which there is interposed between a circular plate carrying the castor wheel and a cylindrical case inserted in the foot of the piece of furniture to which it is to be affixed a series of anti-friction rollers in spherical form, which revolve on small axles inclined at an angle of 45° or thereabout to the perpendicular. These axes being held by a plate to operate as a cage to keep the rollers in position, in this device the rollers are described to take the vertical or load stress and the centrifugal thrust, and they take their bearings on substantially three points or lines of motion, one on an inclined surface of the castor plate and one each on the vertical cylindrical and the horizontal plane surfaces in the case. This contrivance exhibits a ball-bearing or anti-friction device for the conversion of the end thrust or pivot friction from a rubbing friction to a rolling friction, but it does not combine the conversion of a vertical or journal friction, is not constructed or adapted for use either as a journal bearing or a wheel and axle bearing, and could not be applied for either without substantial alteration. I do not find in it the mechanism referred to in the second claim of the Peters patent, either as to the beveled shoulder or the beveled nut or its equivalent or the corresponding bevels in the box cylinder or the rollers having four bearings and taking both the vertical strain and end thrust upon the same bearing surfaces.

202 The Defendant's Exhibit "White 1867 Bearing Patent" also exhibits an anti-friction castor device in which there is a plate to which the castor is attached, having a circular groove in it and a case or flanged disk fixed to a vertical spindle, and having a corresponding circular groove and a series of anti-friction rollers of spherical form between the plate and the case; but there is in this device no such beveled shoulder or beveled nut or beveled cylinder or rollers co-operating in the same way to do the same work as in the Peters device.

The Defendant's Exhibit "Smith 1877 Bearing Patent" exhibits a hub and axle and certain devices constituting an anti-friction roller bearing of the same general class as the Peters, but with several material differences. In this bearing I find instead of a beveled shoulder on the axle, as in the Peters patent, a cylindrical collar of equal thickness at both edges, with sides perpendicular to the axle, with a circumferential groove, semi-circular in cross-section. Instead of the beveled nut of Peters patent I find another cylindrical collar of the same shape and construction as the one last described placed on the outer end of the axle and held there sufficiently for the purpose of assembling, at least, by a threaded spline; and instead of the cylinder in the hub with beveled bearings of the Peters patent I find two end plates, one secured by screws to either end of the hub, each having an annular groove in an inwardly projecting flange, the groove being quarter circular in cross-section and opposed

to a corresponding quarter groove in the hub, and instead of the rollers having four lines of bearing at their ends, as in the Peters patent, I find two series of spherical rollers enclosed in annular grooves, circular in cross-section, half in the collars and
203 half in the hub, and end plates, so that the vertical or load strain will be sustained by the top and bottom of the ball and the end thrust be met by shoulders on the axle or, what is the same thing, the inner collar formed on it and corresponding shoulders in the hub and inner end plate; or else, if the fit or the misfit of the parts should be so as to permit it, the end thrust would be taken by the sides of the balls—that is, the end of the rollers—and hence I do not find in the Smith patent the mechanism or any substantial equivalent for the mechanism in the Peters patent such as is referred to in the second claim.

In the Defendant's Exhibit "Mennon's 1860 Bearing Patent" there is shown and described an anti-friction spherical roller bearing, substantially like that of the Defendant's Exhibit "Smith 1877 Bearing Patent," just above considered; but instead of having the semi-circular groove for the balls at either end, part in the hub and part in an end plate screwed to the hub, this groove in this Mennon's patent is in a separate box, inserted in the hub. The construction of this mechanism differs from the mechanism of the Peters patent referred to in the second claim in that in place of the beveled shoulder on the axle there is a steel ring or collar, working against rubber washers, which rest against a perpendicular shoulder, this collar having a nearly semi-circular peripheral groove; and instead of the beveled nut on the outer end of the axle it has a similar cylindrical collar with a peripheral groove, nearly hemispherical in cross-section; and instead of the bevels or inclined surfaces of the cylinder in the Peters patent it has two collars or boxes inserted in the hub, one at either end, and each having in its inner surface a groove nearly hemispherical in cross-section; and
204 instead of the rollers with conical ends constructed and combined to bear upon their ends upon the bevels of the shoulder nut and cylinder, as in the Peters patent, and to take the vertical strain and end thrust upon the same bearings, I find two series of spherical rollers resting substantially half in the collars on the axle and half in the collars in the box, and taking the vertical strain upon the top and bottom of the ball, and the end thrust on the sides of the ball—that is, on the ends of the rollers—and so constructed that the wheel and axle cannot be assembled or disassembled simply by removing the nut and its shoulders, as in the Peters patent, but only by removing also the end plates and the collars in the box.

In none of these exhibits referred to in the question do I find either the whole structure or any of its essential elements in an anti-friction roller bearing or corresponding parts substanially equivalent to these elements or devices that operate in the same way or that fulfill the same functions or that accomplish the same results as in mechanism of the Peters patent as referred to in the second claim. I do not find either specifically or substantially

two oppositely inclined beveled bearings in the cylinder of the box, two corresponding oppositely inclined shoulders, one on the axle and the other on or movable by a nut on the axle, and a series of rollers conical or formed at their ends for bearing upon the inclined surfaces of the shoulders and cylinder, nor in which the journal and pivot friction are both taken and converted by the same bearing contact surfaces of the rollers, box, and axle, nor do I find in either of the devices either a laterally adjustable anti-friction bearing or any having the means for or capable of lateral adjustment, nor any in which a nut and its incline on the axle are con-
205 structed and operate to serve the double purpose of keeping the rollers in place and the wheel on the axle as in the Peters patent.

For all the reasons above pointed out, therefore, I am clearly of the opinion that the mechanisms and each of them shown in these prior patents are substantially different from and do not anticipate the mechanism of the Peters patent.

For the above reasons, as well as for some others, it is my opinion that both the conclusions and in many respects also the observation and constructions by which he arrives at them, disclosed in the deposition of Mr. Jeffery, referred to in the question, are erroneous, unsound, and incorrect. The incorrectness of his observation and unsoundness of his conclusions are apparent in his answer to his direct interrogatory 15 respecting the Alcott patent, in which he says that the beveled shoulder "F" and the beveled nut "G" of the Peters patent are found exactly in the Alcott patent, and that the beveled portions—that is, the thickened part *a* and the projecting sleeve E of the Alcott patent—partially support the hub, and that the model marked "Defendant's Exhibit Model Alcott Bearing Patent" is constructed in exact accordance with specifications of the Alcott patent.

Adjourned to 10 o'clock September 28, 1887.

SEPTEMBER 28, 1887.

Resumed.

Present as before.

Alcott in his specification expressly says—what is obviously true, from the construction shown in his drawings—that the main anti-friction rollers A are "in rolling contact with the journal B and box G," which precludes the construction assumed by Mr. Jeffery
206 in reference to slight beveled portions partially supporting the hub. The "grooved flange C" in the Alcott patent, and also the grooved nut D in the same, are not constructed with their entire inner faces, which are presented towards the rollers, bevelled as in the Peters patent, nor are they constructed to operate in the mechanism in which they are combined to hold the anti-friction rollers, and through the rollers the hub and wheel in place; but, on the contrary, they have inward faces, perpendicular to the axle, extending radially beyond the cylindrical cavity in the hub and hold the hub by direct plain bearings between them. The grooves

in these perpendicular faces of the flange and nut are concentric with the ends of the small separating rollers, which have conical ends to fit them, but are not concentric with the axes of the main anti-friction rolls H. In order to make the flange C and the nut D of the Alcott patent like the similarly situated parts of the Peters patent the entire outer parts radially beyond the middle line of the groove must be removed; but, having done this, the reconstructor would find the whole mechanism broken up, the small separating rollers left with nothing to keep them in place between the anti-friction rolls and free from the hub, and the hub with nothing to secure it in position on the axle and anti-friction rollers. In the model "Defendant's Exhibit Model Alcott Bearing Patent," constructed by Mr. Jeffery, he has apparently attempted to modify the flange C and the nut D in the manner above indicated by removing the outer parts, but still leaving a thin flange at the outer ends, and, discovering the difficulties and disorganization of the structure, has supplied pieces which are not in either patent, viz., the free rings or collars, one on the flange and one on the nut, which have projecting inclined hollow shoulders to fit upon the exaggerated beveled ends of the rollers, and are free on the nut and flange and also free in the sleeve, which represents the cylindrical part of the hub; but this construction obviously is neither a representation nor embodiment of anything in the Alcott patent nor in the Peters patent, nor is it an operative anti-friction roller device. In the model "Defendant's Exhibit Model Alcott Bearing Patent No. 2," afterwords produced by Mr. Jeffery, I find these principal errors corrected; but in the latter model, also, the "somewhat thickened" part *a* and the projecting sleeve *e* and the somewhat thickened part on it, and the grooves *h* in the flange and nut, and the "somewhat beveled" parts of the main anti-friction rollers are exaggerated in proportions one-half—that is, where the other parts of the model are on a scale of two to one these parts are on a scale of three to one. This model No. 2, however, while it does not fairly represent the relation of the anti-friction rollers to the axle and flange and nut, does well illustrate the difference between the Alcott structure and the Peters structure in respect to the construction of the bearing cylinder in the hub, which is plain in the Alcott and without any beveled shoulders to bear on the rollers, and of the construction of the flange and nut to extend radially beyond the rollers and the cylindrical bearing in the hub and present positive, plain, direct shoulders to the ends of the hub, as in the Alcott patent, and not to hold the rolls in place by their bevels, and, through the rollers, the wheel in place by the bevels in the hub, as is the construction of the Peters patent.

207

As to the Rees 1872 patent, Mr. Jeffery is in error in assuming that the shoulder and nut or the axle of the Rees device "perform the same functions that the corresponding pieces in the Peters patent perform," because they do not perform the function of keeping in place and affording bearings for the beveled ends of anti-friction rollers, but perform the entirely different function of extending by and bearing directly against the hub of the wheel.

208

Mr. Jeffery is also in error in stating that the Vernon 1872 patent device "is an anti-friction bearing," when it has no anti-friction devices at all, but is a plain cylindrical bearing, and is stated by the inventor to be a device "for taking up the lost motion created at the axles of sewing-machines, etc."

Mr. Jeffery is also in error in his answer to the 17th interrogatory, in his conclusion that the "two grooves at the ends of the axle" in the Jewett 1868 patent "perform the functions of the beveled shoulder and beveled nut of the Peters patent," because the grooves are not beveled and do not operate to keep the rollers in place, and through them the hub or box on the axle, or, as it would be in the Jewett patent reversed, to keep the axle in the hub or box—that function being performed by the collar E and the end plates C C—and for other reasons that I have pointed out in considering the Jewett patent above.

Mr. Jeffery is also in error in saying that "this patent of White shows all the features plain in the second claim" of the Peters patent, in his answer respecting the "Defendant's Exhibit White 1867 Patent," and also in assuming that the nut *n* and follower C of the White patent and the disk B are equivalent for the beveled nut and shoulder of the Peters patent, for reasons which I have already pointed out. It may be, as he says, that the device shown in this patent might be placed horizontally and used as a
209 wheel and axle bearing, but it would obviously then be an anti-friction bearing only as to the pivot friction or end thrust, and not as to the journal friction or vertical strain.

Mr. Jeffery is also in error in the same answer in respect to the Perley 1863 patent and the Smith 1877 patent in saying that they show devices corresponding to the beveled shoulder and nut of the Peters patent; for the reasons I have before pointed out, and also particularly in saying that all the parts in the Smith Patent of 1877 "operate in the same way for the same purpose as the bearing of the Peters patent," and also when he says, in reference to the Mennons 1860 patent, that "the beveled shoulder of the Peters patent is shown in one portion of the ring marked M in the Mennons patent," and further that "the nut or its equivalent, correspondingly beveled, is shown in the ring L and nut K," and further that "the parts, separately and combined, are constructed and operate as do the parts described in claim 2 of the Peters patent," for reasons which I have previously pointed out.

Referring now to the deposition of defendant's expert Powers, and particularly to his answer to question seven (7), I find that he he has presented substantially the same points and conclusions in regard to the Peters patent and Alcott, Smith 1869, Bailly *et al.* 1866, Jewett, Perley, White 1867, Rees, Vernon, and the Gardner January, 1871, patents as Mr. Jeffery has, but in some particulars with more positiveness and less discrimination, and with reference to these patents Mr. Powers is, in my opinion, entirely in error, for the same reasons which I have particularly given when considering the patents and the testimony given by Mr. Jeffery.

Q. 42. Please look at the patents—

210 Defendant's Exhibit Chinnock 1853 Bearing Patent,
" " Blanchard 1861 " "
" " Webster 1861 " "
" " Sheldon 1862 " "
" " Barnett *et al.* 1868 " "
" " Gardner April, 1871, Bearing Patent,

which patents I notice defendant's expert Powers testified about in connection with the Complainant's Exhibit Peters Patent and which were not testified about in that connection by defendant's expert Jeffery. Please examine these patents now shown you and state whether you are familiar with them and how they compare with or differ from Peters' invention, as specified in the second claim of his patent, giving such opinions as you desire, with reasons therefor, and also your views in reference to the correctness or errors of defendant's expert Powers in his testimony in reference to said patents.

A. I have examined and am familiar with the patents referred to, and taking them in the order in which Mr. Powers referred to them I find that the Gardner April, 1871, patent shows a bearing step for a vertical shaft, in which the end thrust or pivot friction is taken on spherical rollers in one form and on rollers in the form of truncated cones in another form, the foot of the shaft in either case being provided with a conical surface for impingement of the rollers, and in the case of the truncated cones the step is also provided with a conical face, but I do not find in it either the beveled shoulder or the beveled nut or the "bearings" of the Peters patent, nor could these devices or any of them be substituted in the Peters mechanism or used with wheel and axle without duplication, addition, and reorganization.

211 In Chinnock's 1853 patent there is shown a bearing box for the hub of a wheel and an axle end on which the box takes a plain cylindrical bearing, but in the outer end of the axle is a circumferential bearing, but in the outer end of the axle is a circumferential groove, semi-circular in cross-section, in which is a circular row or series of spherical rollers, these rollers or balls fitting this semi-circular groove and being enclosed as to the remaining half by a ring or collar inserted in the box having a quarter-circular groove and a cap threaded into the box end with a corresponding quarter-circular groove on its flange to form a cover for the end of the axle and of the cylindrical box and of the hole or widening through which the balls are inserted. There is a shoulder on this axle, but it is perpendicular to the axle and not beveled as in the Peters patent. There is no nut or its equivalent on this axle presenting a beveled shoulder, and neither the parts separately nor the mechanism together operate the same way or do the same work or perform the same functions or substantially so as the devices of the Peters patent. I do not understand Mr. Powers to express any opinion that either of these two patents show or anticipate the features claimed in the second claim of the Peters patent, but only to show that the securing of anti-friction balls and rollers in angular grooves is old.

The Blanchard patent of 1861 shows a construction of anti-friction roller bearing for wheel and axle in which a series of plain cylindrical anti-friction rollers are placed on their own separate axles, in a cylindrical box in the hub, the axles of the rollers being held in rings or annular plates, these plates being held together by rods and forming a cage for the rollers. In the box are rectangular shoulders or ledges at the ends for keeping the rollers in the box when the wheel is removed from the axle; there is no shoul-
212 der or nut shown or described in this patent on the axle of any form, but it is obvious that if any be used they must be rectangular or present perpendicular faces; the rollers have no bevels and the box cylinder has no bevels, and it is perfectly obvious and plain that none of the devices, either separately or in combination, which are claimed in the Peters second claim are found in this Blanchard patent.

Adjourned until 2 o'clock.

Resumed.

In the Webster patent of 1861 is shown a journal bearing constructed with a sleeve on the journal, having a circumferential groove nearly semicircular in cross-section and a series of spherical anti-friction rollers contained nearly half in said groove and nearly half in a similar groove in the box, and the box is described to be divided either vertically or horizontally; but the mechanism shown and described in this patent does not contain the beveled shoulder on the axle and the nut with its corresponding beveled shoulder of the Peters patent, nor any such combination of devices or organization of the structure or any substantial equivalent for them shown in the Peters patent.

The Sheldon patent of 1862 shows a device for a castor in which, in place of the usual castor wheel, there is a sphere or large ball held for its larger part in a cup-shaped case, and between it and the grooved inside bearing parts of the case are inserted a series of anti-friction balls bearing upon the sphere and upon a ring in the cup. It is obvious from inspection that the mechanism of this Sheldon patent could not be adapted for use as a wheel and axle bearing, and that it does not contain the beveled shoulder and the nut with a corresponding beveled shoulder of the Peters device.

213 I do not find that defendant's expert Powers has expressed it anywhere as his opinion or conclusion that either of these last-named patents anticipates the Peters device referred to in the second claim, or that either of them shows substantially the same mechanism or combination of elements operating substantially in the same way to produce substantially the same result; but for the reasons I have before pointed out I differ from the conclusion of Mr. Powers at the end of his answer to question seven, that "in view of the foregoing state of the art it would appear that Peters at the date of his patent, if he invented anything—in other words, devised anything—that was new, it was, at best, upon a very limited scale." It does appear from the whole state of the art produced, in my view,

that the Peters patent was the first to show a mechanism for an anti-friction roller bearing for a wheel and axle in which there is a series of anti-friction rollers interposed between the arm of the axle and the cylinder of the hub or box, a beveled shoulder on the axle, and a beveled shoulder on or connected with a nut and corresponding bevels in the cylinder, the rollers being shaped and combined with these parts, to rest at their ends against the beveled bearings on the axle and in the cylinder, and take both the lateral and the vertical strain; and this, in my view, was a substantial and important step or advance, and afforded the beginning of a new departure in the art of construction of anti-friction bearings.

I find that I had overlooked the Barrett patent of 1868, referred to. His patent shows a bearing or step for a vertical shaft, having spherical anti-friction rollers on which the lower end of the shaft rests and which in their turn rest upon a plate; but it is obvious upon inspection that this patent does not show or describe any de-
214 vices like or substantially equivalent for the beveled bearings of the Peters patent, and it comes within the observations which I have previously made regarding anti-friction roller steps for vertical shafts.

Q. 43. Please look at the patents now shown you, viz:

Defend-nt's Exhibit		Bate	1878	Bearing	Pat-nt.
"	"	Monks	1880	"	"
"	"	Lewis	1879	"	"
"	"	Salamon	1880	"	"
"	"	Jeffery	1883	"	"
"	"	Smith	1877	"	"
"	"	Bown & Hughes	1880	"	"

these being the patents experted by the defendant's expert as containing in some form some of the devices shown and described and made the subject-matter of one or more claims of Complainant's Exhibit Wallace Patent No. 1 or of Complainant's Exhibit Wallace Patent No. 2, and state whether you are familiar with these patents, and if you are please compare the said defendant's exhibits with the devices of the Wallace patents, pointing out their similarities and differences, and also give such opinions as you may have in reference to the correctness or otherwise of the opinions expressed by defendant's experts with reference to the similarities or differences between the mechanism of defendant's exhibits and the mechanism in said Wallace patents as expressed in the claims in controversy, giving such reasons as you may have for any opinions you may express.

A. I am familiar with the patents referred to. The Bate patent shows, at figure 18, and describes briefly and rather incompletely in connection therewith, an axle-bearing for the front wheel of a
215 bicycle in some respects resembling that shown in the Wallace patent No. 1. It has an axle box connected with or partly formed on the lower end of the steering fork between the crank and the hub flange, through which the axle projects, and in the box is a single series of anti-friction rollers, and on the axle are two cones. These rollers are short cylindrical rollers, having conical ends sim-

ilar to those of the Peters patent, and taking their bearings, like those of the Peters patent, upon the conical surfaces of their ends, which impinge against the conical surfaces in the box and of the cones on the axle. The inner ones of the cones on the axle appears to be fixed to the axle, and the outer one rests against the inner face of the crank box. The "case A" at the lower end of the fork appears to be made integral with the lower end of the fork, and extends laterally on either side the fork to cover substantially the breadth of the bearing. Its further construction is not described, but I understand it to be divided horizontally, as was usual in the art at that date for the purposes of assembling, and within this case is a steel "bush, B," containing a beveled groove in its inner cylindrical surface, in which the rollers run, and it is not described or shown whether this bush is split or divided or not; but, as I understand it, it extends around the rollers and the cones, is of a length to cover both, and is held in the case A. In assembling, the outer cone C on the axle is the last piece except the crank and its securing screw to be put in place, and is "set up" by the crank box, the inner face of which rests against it, and, when secured by the screw or short bolt which holds the crank, holds this outer cone in place. The axle and the interior of the cones and of the crank box are described to be hexagonal or octagonal in shape to prevent their turning upon the axle. Figures 19, 20, 20*a*, and 21 show other forms of bearings or parts of bearings having plain cylindrical or conical parts, but not having anti-friction rollers; and, as I understand it, the mechanism shown in figure 18 and described in connection with it in paragraph beginning "figure 18 is a section," on page five of the specification, is all there is in this patent relating to an anti-friction bearing.

216

This mechanism of Bate differs from the mechanism of Wallace patent No. 1 in several material respects. It does not contain a series of balls or spherical rollers, and could not receive balls in place of the conical rollers without some modifications. It does not have a threaded sleeve nor certain other details and relations of construction by which one of the cones on the axle may be advanced toward the other not only at the time of assembling the machine, but at any time afterwards to adjust the bearing to compensate for wear of the bearing parts, nor is there in it any threaded recess in the crank boss or any recess for the sleeve in the hub flange, nor any adjustable collar, nor any screw thread at the outer end of one part of the sleeve operating to draw it toward or from the other part, nor a two-part sleeve or collar having one part of the sleeve loose on the axle and bearing against the hub, nor one part of the sleeve adjustable towards the other by means of a screw-thread and revolving on the axle, nor, in fine, any mechanism, either the same or substantially the same, as is set forth in either of the claims of Wallace patent No. 1.

Adjourned to 10 o'clock, September 29, 1887.

217 SEPTEMBER 29, 1887.

Resumed.
Present as before.

In observing the differences between mechanisms like those of Bate and Wallace and some others which we shall have occasion to consider, relating to bicycles and tricycles or modern velocipedes, it is necessary to consider that these are fine and highly specialized forms of machinery, and that in these, as in other such refined and specialized mechanisms, slight changes or apparently slight changes of construction often produce important changes of result, and that which might be comparatively insignificant in grosser machinery and applied to different uses or less specialized uses, as wagons, may be significant and important in bicycles. In this bicycle front wheel and bearing mechanism to which both the Bate and Wallace patents relate it is to be observed that there is a limitation in space necessary between the outer ends of the axle on account of the structure of the machine and the use to which it is put, so that a suspension or double flanged wheel of sufficient breadth, two bearings for the fork ends with their appropriate devices, and two cranks and their securing devices shall be brought within a certain space or within the limit of "tread," as it is called in the art, for the rider. The wheel is a fixed wheel—that is, it is fast upon the axle. The cranks also are fixed, necessarily, and the bearing devices must be between the cranks and the hub flanges or the wheel, and owing to the strains and jars incident to the use of the machine the cranks, as well as the wheel, must be tightly and securely fixed to the axle. The required delicacy of anti-friction devices in these machines is also much greater than that re-
218 quired in wagons or other gross carriages drawn by horse or other power, since the limitations of human power require greater nicety and economy. The bearings of the bicycle wheel do not always sustain the load strain practically in a vertical direction or not as closely as in ordinary carriages running on four wheels upon road surfaces substantially horizontal, for the bicycle wheel is seldom in a vertical plane exactly and often in a plane very much inclined to the vertical, owing to the two facts that in the use of the bicycle the rider keeps his equilibrium in great part by an average of undulation of the wheel or vibrations across the vertical plan-, and always makes a wavy or curved track even on a straight road, and also in turning curves inclines toward the center of the curve which he is making. The load strain is not always, therefore, vertical to the axle, and the and thrust becomes much more important to provide for. Owing to the shortness of the axle, now usually not exceeding eight or eight and one-half inches or a distance of six inches or less between the centers of the bearings in the fork ends, and the large diameter of the wheel, averaging a radius of about twenty-seven inches and sometimes being even thirty-two inches, slight play or looseness or misfit or bad adjustment at the bearings makes a considerable and mischievous play at the periphery of the

wheel and tends to rapid wear and destruction and also to increase of friction and other mischievous consequences to the bearings. In the construction of modern bicycle bearings with anti-friction devices the parts are required to be made with surfaces constructed with mathematical accuracy and of finely hardened material; and in the construction of the balls or anti-friction rollers variations of one two-thousandth of an inch in diameter or in sphericity or in the dimensions of the several balls used
219 in the series in the same bearing is sufficient for their rejection, and would be injurious or mischievous in the operation of the devices. In assembling the parts for these bearings nicety is required in the adjustment of the bearing surfaces to the balls, and this nicety is illustrated by the fact that in adjusting a ball bearing such as is used by the complainant or the defendant, where the adjustment is made by a screw concentric with the axle, having about thirty-two threads to the inch, the difference of one-third to one-half of a revolution of the screw makes the difference between a tight bind and a moving freedom of adjustment of the bearing. The ready method practiced with the Wallace bearings in assembling and adjusting for use being to turn the adjusting cone up until it makes a tight seat on the balls and then let it back one-third of a turn; owing also to the considerations of proportions and nicety above mentioned, as well as to the fact that in these bearings small balls have to be used of four or five sixteenths of an inch in diameter, the jars and strains in use of the bearing produce a wearing of the parts which will throw out or destroy the best initial adjustment at the assembling of the machine, and require a readjustment or compensation for this wear of the parts, and this readjustment or compensation for wear must be as accurate and as delicate as the original adjustment in assembling.

Now, on turning to the device or mechanism shown in the 18th figure of the Bate patent and the description of it in the specification, it is apparent that Bate has the elements of the Peters patent—that is to say, *that* the conical-ended rollers, the beveled shoulder on the axle and an opposite bevel on the axle, and the two corresponding bevels in the notch—with the differences that he makes his rolls shorter and does not place his removable beveled
220 shoulder or cone on the axle or a nut or connect it with a nut, but has it connected with the boss of the crank. It is also obvious that as the boss of the crank extends radially beyond the bearing box and presents a bearing face to it on one side, and on the other side of this bearing box the hub-flange presents a similar bearing face to the end of the bearing box, the anti-friction devices operate to take the vertical or load strain and the crank boss and hub flange to take the end thrust, and that when the wheel is inclined at an angle to the vertical plane the load strain will, more or less of it, be taken on the plane bearings between the box and crank or flange. It is also obvious that in this construction with conical-ended rollers there is not that complete taking and conversion of the pivot friction or end thrust and that complete taking of all the friction of the bearing off from plane-bearing surfaces and

onto rolling surfaces which is found in the Wallace construction. It is also obvious that this mechanism of Bate does not provide for or permit that adjustment or compensation for wear of the part which is one of the chief features of the Wallace construction. If it be said that these parts of Bate's might be adopted for compensation for wear, as, for instance, by making the box narrower or shorter or by making the outer cone C longer, so that the crank could be forced against the cone and not against the box, then I answer that it is not so shown or contemplated by Bate, and that this would be a change of structure; and I go further and say that even then this device of Bate would, in my opinion, based upon my knowledge of the manufacture and construction and use of bicycles—that this device of Bate, so amended, would still be an inoperative device for the purpose of adjustment or compensation for wear. In a shop with skilled
221 mechanics and ready tools and appliances and sufficient patience the parts might be assembled, perhaps, with sufficient accuracy, either as shown in the Bate patent or amended as I have just supposed; but with the crank set upon the axle by a plain hexagonal or other similar bearing, as shown in the Bate patent, with sufficient lightness for reasonable use and the free cone simply butting against it, it would be impracticable to make the adjustment with these devices, as I have above described, and this fact of impracticability of using the crank as a means of adjustment in place of a nut or threaded cone is particularly well illustrated in defendant's machines, "Exhibit Light Champion Bicycle," where, although there is a crank better adapted than that of Bate for making such adjustment, in that it has a special device in the crank boss for loosening and tightening the bearing of the crank boss upon the axle end, it is not found practicable to make the adjustment by that means, but is found requisite to have a threaded cone with nut action, as shown in the Wallace patent.

It is my view, therefore, that defendant's experts are in error in assuming that the devices in the Bate patent are adopted for adjustment for wear and securement in position substantially as in the Wallace patent No. 1. I am aware that reference is made by them to figures 20 and 20*a* as showing two cones, one sleeved upon the other, with a jam nut against the outer one, but these are described by Bate to be for other forms of bearings, which he does not fully describe, but which are presumably intended for details of bearings different from either the Bate structure as shown in figure 18 or the Wallace structure.

222 The provisional specification of Monks marked "Defendant's Exhibit Monks 1880 Bearing Patent" does not, in my view, describe with sufficient clearness an anti-friction bearing structure with sufficient definiteness to enable an ordinary mechanic in the art to construct it, and certainly it does not describe a structure like or substantially like that of Wallace. With full knowledge of the modern development of anti-friction bicycle bearings one might now go back to the Monks provisional specification and import and interpret into it either one of two or three constructions, perhaps,

with some degree of conformity to the language and description of Monks; but I do not understand how any structure that contains as part of the bearing devices "a turned bush, conical at the outer end, and a somewhat similar one which is secured upon the outside of the first said bush," or which has a construction containing "the lower part of the fork, which forms a cap, somewhat circular, with a segmental groove in it for the balls to work in," or which has a bush at the same time "conical at the outer end," and, with the outer end of the bush, is formed into a milled "or ratchet head," can be like the structure of the Wallace patent No. 1.

In "Defendant's Exhibit Lewis 1879 Bearing Patent" are shown two forms of bearing, one of which is a plain conical bearing, as in figure 1, and the other an anti-friction roller bearing, both shown as designed, for the front-wheel bearings of a bicyle. The latter form, as shown in figure 3, contains two cones on the axle, one of which butts against the hub flange and the other against the crank boss, and around them is a case or frame forming, in part, the lower end of the front fork, and within this case or frame and between it and the cones on the axle is a series of cylindrical rollers having conical or beveled ends similar to those of the Bate and Peters pat-
223 ents, which rests upon beveled or inclined surfaces in the box and on the axle. This device differs from the Bate device in having a small set screw, marked D in figure 1, threaded through the crank boss on one side of the axle and impinging against the outer vertical face of the outer cone. The construction and description show that the axle is flattened to meet a flat face on the interior of the cones, so that the cones cannot revolve on the axle. The outer cone is referred to in the specification as an "adjustable cone." This is all the description of adjustment I find in the specification. By the construction as shown in the drawings it appears that the divided outer case of box F has plane beveled or conical surfaces also, which bear upon the beveled or conical surfaces of the cones—equally, at least, with the conical ends of the rollers—so that the friction caused by the vertical or load strain in this bearing is partly a rubbing friction and partly rolling, and that the friction of end thrust is wholly rubbing. The set-pin D might be turned inward tighter against the outer cone, and thus, if the cone were loose enough, accomplish some sort of adjustment, but the pressure from this screw-pin being wholly on one side of the cone ring, would tend immediately to tilt the ring and cause it to bind and prevent adjustment if the cone formed a reasonably tight fit on the axle, and if the cone formed a loose fit on the axle it would tilt the cone and destroy the accuracy of the bearing and in a short while the whole anti-frictional efficacy of it. I do not find in this patent either a series of balls or an undivided box or a two-part sleeve having one part threaded or connected with a concentric screw-thread, or the mechanism either in whole or in substantial part set forth by Wallace and claimed in either of his claims.

Adjourned to 2 o'clock.

224 Resumed.

I note that one of the defendant's experts, Mr. Jeffery, assumes that the box marked F in this Lewis patent is a one-part bearing box in the sense of the Wallace patent, which is, in my view, an entirely unwarranted assumption, since neither description nor drawings show it to be so, and the construction calls for a horizontally-divided box, which was the common construction at that date, and which a view of this bearing in elevation would undoubtedly have shown. I note also that he says that the parts in this Lewis patent "are combined and constructed for securement in position and for adjustment in wear by the pressure of one part of the sleeve against the hub of the wheel and by an external thread on the other part of the sleeve," etc., which is incorrect, as shown by his subsequent statement that this "external thread" is not a part of the sleeve but does consist in the screw-pin, and, for the reasons which I have already given, his conclusion that the operation is the same is, in my opinion, erroneous. In my view the descriptions and the conclusions of both Mr. Jeffery and Mr. Powers are incorrect and unsound for the same reasons which I have already pointed out.

"Defendant's Exhibit Salamon 1880 Bearing Patent," referred to by Mr. Powers as limiting the scope of Wallace patent No. 1, shows and describes an anti-friction ball bearing for a velocipede which has two series of balls which bear, each series, on one curved surface in the box and one curved surface on the sleeve, but I do not find in it either the single elements or the combination or the structure of Wallace, as referred to in the second and third clauses of claim of patent No. 1. I note also that Mr. Powers refers to the

225 Smith 1877 patent and rather hastily remarks that it shows a bearing "with screw devices, with which the parts can be adjusted to each other and to compensate for wear," which is an error of observation, obvious upon an examination of the Smith patent, which neither shows nor describes any means of adjustment for wear, and in which the construction precludes any such adjustment.

Now, in neither of these prior patents referred to do I find any anti-friction bearing for a wheel and axle constructed with a bearing box undivided and affording beveled bearings for a series of anti-friction balls and a sleeve on the axle in two parts, one limited in its motion by the hub and the other by the crank, and each affording an inclined bearing for a series of anti-friction balls, and a series of such anti-friction balls or spherical rollers within and between the bearing surfaces in the box and on the sleeves, with a screw-thread on one part of the sleeve, outside of the bearing box, and operating concentrically with the axle to adjust this part of the sleeve toward the other part and thereby adjust the relative positions of the balls and their bearing surfaces in the box and on the sleeves, so that both the journal friction and the pivot friction shall be entirely taken upon the balls and converted from rubbing into rolling friction, or so as to permit, accomplish, and secure a compensating adjustment for wear of the bearing surfaces, as set forth

and claimed in the Wallace patent box, or anything materially or substantially like such an organization, and for this reason, as well for others, which I have previously pointed out, the opinions of defendant's expert, that the second and third clauses of the claim of this Wallace patent are anticipated by either or all of these prior patents are incorrect and unsound.

226 Turning now to the Wallace patent No. 2 and the Jeffery patent referred to by Mr. Powers and Mr. Jeffery as anticipating the second and third claims of the Wallace patent No. 280,421, I am of opinion that their observations and conclusions are incorrect for the following reasons: The second clause of claim of this Wallace patent No. 2 does not include as one of the elements of the mechanism the free bearing box E, as assumed by Mr. Powers, nor are the free bearing box G and the shell case E of the Wallace third claim identically shown and described in "Defendant's Exhibit Jeffery 1883 Bearing Patent," as remarked by both defendant's experts. The devices shown in this Jeffery patent differ from the corresponding ones shown either in the Wallace patent No. 2 or in the defendant's machines, Exhibits "Champion" and "Light Champion" Bicycles, in several respects. In this Jeffery patent the lower fork end is constructed with a yoke or inverted U-shaped part, X, having a semi-circular opening in its under side transversely grooved on the arc of a circle in cross-section and terminating in two horizontal ears or lugs, and this lower fork end is complemented by an under piece having a similar hemispherical grooved opening and similar horizontal lugs, and within this halved fork end so constructed is placed a bearing ring or case containing the balls and having its periphery rounded to fit exactly throughout its peripheral surface the interior grooved surface of the fork end and its complement, which two latter are clamped together by their lugs and by short bolts through them so as to form practically together with each other and with the ball case one solid part, separable or relatively movable only by disassembling; whereas in the Wallace patent the shell case E

227 has its cylindrical interior surface or contour different from that of the exterior of the ball case and freely fits the circumference of the latter and is secured in position in such manner as to allow a play or adjustment between the two after assembling to allow for any spring of the axle or of the frame and afford a compensation and preserve a rectitude of position in the ball case with reference to its internal bearing mechanism, while in the defendant's machine, Exhibit "Light Champion," the form of construction is varied, the shell case being open and in two parts, hinged together, and its interior surface is curved more nearly to correspond with the curved periphery of the ball case, yet the same operation of parts as in the Wallace patent is provided for, though less advantageously, by the bolt uniting the lower ends of the shell case, which, with its nut, may be left free or tight at choice; but I do not consider it material to discuss the materiality or the immateriality of the differences of structure between the Jeffery patent and the Wallace patent, as I do not understand the Jeffery patent

to be a prior patent in the sense of being a patent issued or applied for prior to the Wallace invention, although it bears a somewhat earlier date than the Wallace patent. Wallace's invention and devices as shown in this patent No. 2 were in use prior to the date of the Jeffery patent or the Jeffery application and I, myself, amongst others, rode a machine made by Mr. Wallace or under his direction, and containing them, in the fall of 1882.

Mr. Jeffery refers to the "Defendant's Exhibit Salamon 1880 Patent" as containing a shell case and free bearing box corresponding with the construction claimed in claim 3 of this Wallace patent No. 2, and says he regards it as identically the same thing; but both his observation and his judgment must be erroneous, for the
228 construction shown in this Salamon patent is that of a bearing box or case held securely in a clamped outer case, with a rubber part interposed between them and in grooves in both of them to absorb the jar of the metallic parts, and Salamon's construction shows neither the devices nor the combination nor any operation to perform the functions nor accomplish results set forth in this Wallace patent.

As to the second claim of this Wallace patent No. 2, I note that Mr. Jeffery is in error in saying that the Monks 1880 patent "shows" this invention, because there is no drawing with this Monks provisional specification, and also in inferring that the Monks provisional specification describes the mechanism set forth in this second claim or anything like it or substantially like it for reasons which I have explained before, and because he does not describe so clearly that a common mechanic in the art, without anything before him but what existed at the time of the Monks patent, could construct any such device as that of Wallace. A mechanism in which there is a turned bush, at the same time conical at the outer end and provided at the outer end with a milled or ratchet head, or which has one bush screwed upon the outside of another, and a lower part of the fork, which forms a cap somewhat circular, with a segmental groove in it for the balls to work in, necessarily excludes the Wallace construction. I note that he also refers to "Defendant's Exhibit Brown & Hughes 1880 Patent" as anticipating this second claim of Wallace patent No. 2; but I do not find in it either a two-part sleeve or a single or one-part bearing box or case or a serrated annulus connected with a movable cone on the axle and arranged between the bearing box and the hub of the wheel, as described and referred to as elements of that caim, nor do I find in it
229 either the mechanism or any substantial part of it like or substantially like that specifically pointed out in Wallace's second claim or that operates in substantially the same manner, and for these reasons, as well as for reasons before given, the conclusion of defendant's expert in regard to this second claim of Wallace patent No. 2 are incorrect and unsound.

Adjourned to 10 o'clock, September 30, 1887.

SEPTEMBER 30, 1887.

Resumed.
Present as before.

The reconstruction and improvement of the structure described and shown in Wallace patent No. 1, which is set forth and claimed in the second clause and claim of this Wallace patent No. 2, is a substantial improvement, the advantages of which are not only distinct in the tricycle construction shown in this patent, but also and more conspicuously in bicycle construction as shown in the Exhibits Expert Columbia Bicycle and American Light Champion Bicycle, where this construction enables, among other things, not only a better construction and operation of the adjusting devices, but also the projection of these devices in the dished flange of the wheel, and thereby a narrower or more compact arrangement on the axle, and a narrower "tread" and shorter axle for the bicycle, as I have before explained. For these reasons and others which I have given, the opinion expressed by Mr. Jeffery to the effect that there is no invention in this second clause of claim of this second Wallace patent is, in my view, erroneous.

Q. 44. Have you examined carefully the testimony of defendant's expert so far as it relates to the similarity and dissimilarity
230 of the mechanisms which they find to be embodied in the respective bearing patents of the complainants, viz:

Complainant's Exhibit Peters Patent,
" " Wallace " No. 1,
" " " " " 2,

and the bearings in the complainant's exhibits defendant's machines? If you have, will you point out to the court any mistakes or errors which you find in reference to the mechanisms referred to in such comparison, and also explain to the court in that connecnection any differences between said defendant's machines and the devices referred to in contract No. 3, relating to the devices which it was agreed was covered by either or any of said complainant's patents.

Defendant's counsel objects to the last part of this question as incompetent and as new matter, not in rebuttal.

A. I have examined the testimony referred to and will endeavor to point out some of the material errors of perception, statement, and judgment which occur in it, according to my view, and my reasons for contrary opinions.

I first produce a specimen or sample of one end of the axle and hub of a bicycle with its crank, bearing box, balls, and sleeves, all as constructed under and according to the Wallace patent No. 1 referred to, except that the outer sleeve, which is threaded and extends into the crank boss, has a serrated annulus and locking button on the crank to set it instead of being plain and held by a set-screw, as shown in that patent. This sample was, to the best of my knowledge, made in 1882, and I have not now been able to lay

my hand upon a sample of the prior construction which was similar in all respects except as to the milled annulus and button.

231 I also produce an Expert Columbia bicycle hub and axle and bearing and crank, made in 1883 or 1884, and which is a specimen or sample of the Expert Columbia front-wheel bearing construction referred to in contract No. 3 as containing the Peters and Wallace inventions and of both Wallace patents.

I also produce an Expert Columbia rear fork and rear wheel hub, axle and bearing, as made and used on the Expert Columbia bicycle in 1884, the parts of which are not finished up for use, such as was referred to in the contract No. 3 as containing the Peters invention.

I also produce a Columbia bicycle pedal, which was made and used prior to December, 1884, on the Expert Columbia bicycle, containing bearings referred to in the said contract No. 3.

I also produce an Æolus ball pedal, such as was in use in 1884, and referred to in the contract No. 3; this particular specimen of Æolus ball pedal bearing the name of Overman Wheel Company, as well as Bown, and which it was made by I cannot state now, but it is similar to all those known as Æolus ball pedals at that time, whether made by Bown or not.

These specimens which I have produced are not only the bearings referred to in contract No. 3 and stipulated therein to contain the inventions of Peters and Wallace, but do contain, in my opinion, each of them clearly and in a substantially like manner to those of defendant's machines inquired of, the invention of the second claim of the Peters patent, and the front-wheel bearings contain likewise the invention of the second and third claims of the first Wallace patent, and the one with the annulus and button on the hub side of the bearing box contains likewise the invention of the second

232 claim of the second Wallace patent, and in substantially the same manner and construction as shown in defendant's machines, Exhibits "Champion" and "Light Champion."

Counsel for complainant offers in evidence the front-wheel ball bearing of the Expert Columbia bicycle referred to in contract No. 3, and requests that the same be marked for identification "Front-Wheel Ball Bearing of Expert Columbia Named in Contract No. 3." (And it is so marked.—L. G. F.)

Also a front-wheel ball bearing in the form used on complainant's machines and made in 1882, and the same is marked for identification "Complainant's Model Exhibit Wallace Patent No. 1." (And it is so marked.—L. G. F.)

Also an unfinished rear-wheel bearing and fork of Expert Columbia referred to in contract No. 3, and the same is marked for identification "Complainant's Model Exhibit of Rear-Wheel Ball Bearing of Expert Columbia Referred — in Contract No. 3." (And it is so marked.—L. G. F.)

Also a pedal of the Expert Columbia referred to in contract No. 3, and the same is marked "Complainant's Exhibit Expert Columbia

Pedal Referred to in Contract No. 3." (And it is so marked—L. G. F.)

Also Æolus ball-bearing pedal, and the same is marked "Æolus Ball-Bearing Pedal of Contract No. 3." (And it is so marked.—L. G. F.)

In my view defendant's experts are right in assuming that a series of rollers, having their ends adapted to bear upon the beveled surfaces, is essential to the proper construction of the second claim of the Peters patent, but the statement of Mr. Powers that
233 there is little or no bearing of these rollers in the Peters patent upon their beveled ends is erroneous, because, first, in the drawing of figure four, referred to in that claim, the beveled ends of the rollers are shown to bear firmly and closely on the beveled surfaces of the shoulder and nut and of the box cylinder, and are not shown to bear with their longitudinal cylindrical sides upon the longitudinal cylindrical parts of the axle and cylinder between the bevels; and, secondly, because the Peters specification describes that these rollers bear upon their beveled ends upon the bevels upon the axle and in the box, and are relieved from bearing upon the cylindrical parts; and, thirdly, because the construction of the mechanism not only permits but requires that the load strain be borne upon the bevels.

Adjourned to 2 o'clock p. m.

Resumed at 2 p. m.

I understand Mr. Powers to assign as his only reason that the front-wheel bearings of defendant's machines, Exhibits "Champion" and "Light Champion," do not infringe the Peters patent to be this, that they have instead of a nut of the form of Peters' "a plain-faced nut, which acts against a sleeve, which moves longitudinally upon a feather, and having a beveled front that corresponds with a bevel upon the bearing, and thus forms an annular beveled groove; * * * thus, while defendant's device has parts that form an annular groove, it is not formed by a nut having a beveled shoulder," and this reason is, in my view, invalid and insufficient, because the piece so referred to which corresponds with the Peters nut operates precisely in the same way to accomplish precisely the same work and performs precisely the same func-
234 tion as the Peters nut, and has a threaded part concentric with the axle for imparting motion to it precisely like that of a nut, but differs in form in having the screw-thread on its exterior surface instead of its interior surface, just as in Complainant's Exhibit "Front-Wheel Ball Bearing of Expert Columbia Named in Contract No. 3."

Mr. Powers assigns as his reason for saying that the rear wheel and pedals of the defendant's machines, "Champion" and "Light Champion," do not infringe the Peters second claim this, that they employ two series of spherical balls, one at each end of the bearing, that are adapted to rotate in annular grooves of a circular

form, and do not contain the roller device of the Peters patent, or, rather, that the spherical rollers are radically different from cylindrical rollers; and this reason is, in my view, invalid and insufficient, because, as well enough shown by defendant's experts, spherical rollers were known as well as cylindrical rollers at the date of Peters' patent, and were and are adapted to be used in exactly the same construction of beveled cylinder and beveled shoulders on the axle in place of and in the same way, so far as the rollers are concerned; and, further, because these devices of spherical rollers in the defendant's machines in the rear wheel and pedal bearings are combined to operate in place of and substantially in the same way and for substantially the same purpose as in the Peters patent—that is to say, these rear wheels and pedals contain in their bearing mechanisms the two beveled surfaces in the cylinder or box, the two beveled surfaces on the axle, one of them movable toward the other, rollers bearing with their conical ends upon these beveled surfaces in the box and upon the axle so as to take both the vertical and lateral thrusts

235 upon these bearing surfaces, and the line or circle of division between the axle devices and hub devices bring substantially midway or near the axle line of the rollers. The fact that the rollers have hemispherical ends instead of straight conical ends, and that the beveled surfaces are on a curve in cross-section instead of in a straight line, and that the nut is cut in two vertically so as to admit the fork end between one part of it and the other, does not make any substantial difference either in the construction or the operation of these devices. As aiding to illustrate to the eye the operation of the nut, rollers, and bearing surfaces in the Peters patent, second claim, and of the corresponding parts in the rear wheels and pedals of the defendant's machines I produce here two board models—one of the ball construction, as in defendant's machines, and the other of the identical construction of rollers as shown in the Peters patent—from which it will be seen that the nut and shoulder on the axle, with the diagonally opposite shoulders in the hub cylinder and the rollers between, operate substantially in the same way in each to adjust the bearings, to keep the rollers in place, and through them to keep the hub on the axle.

Counsel for complainant offers in evidence the board illustrations referred by this witness, and requests the same to be marked "Complainant's Exhibit Board Illustrations No. 1 and Complainant's Exhibit Board Illustrations No. 2." (And they are so marked.—L. G. F.)

The curved surfaces on the axle and the hub *and* defendant's machines are practically the grooved inclines provided for in the Peters specification. They are curved on curves of different radius from the radii of the balls, and they are presented to the balls in such a way as to act precisely like inclines or cones. Mr.

236 Powers' assumption or conclusion that the Peters device, as shown in figure 4, would be practically useless as an anti-friction device is erroneous, in my opinion, not only for the reason

that well-known mechanical principles should teach him better, but also for the reason that devices constructed in a similar manner do operate practically as anti-friction devices in the industral arts, nor is there any reason assigned for his conclusion with respect to this device with anti-friction rollers which would not apply with equal force to bearings without anti-frictional devices having beveled bearing surfaces, which are and are admitted to be practical. The fact cited by Mr. Jeffery in this connection that the balls may roll on a never-changing axis instead of upon one predetermined axis may be a good reason why balls are of better shape for anti-friction rollers in these bearings and better adapted for taking both vertical and lateral st-ain and converting into rolling friction than the form of rollers shown in the Peters patent, but the balls are nevertheless rollers and roll but upon one axis at the same time, and when they are substituted in a mechanism containing the other devices of the Peters patent in place of the Peters rollers, and so that they and the other devices operate in the combination in the same way and for the same purpose, they do not save the mechanism in which they are placed from infringing the Peters claim by reason of their being spherical in form. I see that Mr. Jeffery also says that the rear wheel and pedals of the defendant's machines are constructed like the Mennons 1860 and Jewett 1868 patents; but in this he is in error, because there exist between the defendant's devices referred to and the devices shown and described in these prior patents just the same differences that exist between these prior patents and
237 the device of the Peters second claim, and therefore, for the same reasons which I have given, that the prior patents do not anticipate the Peters claim, I find that the devices of defendants are not like these prior devices, but are like the Peters device.

In regard to the Wallace patent No. 1, defendant's expert Powers differentiates the front-wheel bearings of defendant's machines, "Champion" and "Light Champion," from the mechanism claimed in the second and third claims of Wallace patent No. 1 by saying that "their screw adjustment is at the inner end of the inner sleeve instead of at the outer end, as in Wallace; and, further, that the screw is so adapted that it will only carry the sleeve forward instead of forward and backward in Wallace; and, further, that the sleeve having the screw-thread does not rotate upon its bearing, but is only capable of sliding forward and back when acted upon by its rotating nut." These three differences of form are all, as I understand it, that he finds, and he does not allege any difference of function or mode of operation or work performed, and, in my view, these three reasons of his are not sufficient to sustain his conclusion, nor are the differences pointed out material or substantial differences, so far as the consideration of infringement or non-infringement of the devices is concerned, nor are these three differences quite accurately pointed out. It is to be observed that the second clause of claim in Wallace patent No. 1 does not limit the invention at all in respect to the three points of difference noted by Mr. Powers, unless it be in the two words "and from" at the end of the last line but one and the beginning of the last line of the

claim, for I understand the word "outer," as used in the Wallace specification and claim and applied to the ends of the sleeves,
238 to mean the end outside of the bearing box and not necessarily the end farthest from the wheel, and, according to Mr. Powers' description of the defendant's devices, there is a screw-thread at the outer end—that is, at the end outside the bearing box, of course—of one part of the sleeve, just as in the Wallace patent, which disposes of his first objection, and also that this screw-thread operates to draw this part of the sleeve on which it is toward the other part, but Mr. Powers says in his second point that this thread does not draw one part of the sleeve from the other part. To this I answer, first, that drawing one part of the sleeve toward the other part is the principal object and purpose of the adjusting devices, and that the function of the device in question is substantially performed when that is done, since the pressure on and through the balls tends all the time to push it in the other direction; and, secondly, I answer that Mr. Powers is in error in his observation, and that the screw-thread does operate to draw the part of the sleeve on which it is from the other part in adjusting the bearing when the operator takes the nut which is threaded upon it to adjust the bearing, either in assembling or in compensating for wear, the pressure on the nut being communicated through the screw-thread to that part of the sleeve.

Adjourned to 10 a. m. October 1, 1887.

OCTOBER 1, 1887.

Resumed.
Present as before.

In my view the third difference assigned by defendant's experts, viz., that the movable part of the sleeve in the defendant's machine does not revolve upon the axle, but only slide upon it, is not a material difference in considering the question of infringement,
239 because, as I have pointed out already and is admitted by defendant's experts, this movable part of the sleeve in defendant's machines is operated toward and from the other part by a screw-thread on its outer end concentric with the axle and so as to advance all sides of the cone at the same time, so as to adjust the bearing for the whole circular row of balls equally and with the same accuracy.

I understand Mr. Wallace to have been the first in the art to construct an anti-friction roller bearing for the front wheel of a bicycle that is to be operated on either side or end of the hub on a fixed axle between the hub end and a crank boss, having a single circular row of balls or spherical rollers held between four beveled or substantially conical bearing surfaces, two of these bearing surfaces being in an undivided box and two of them on a divided sleeve on the axle, and in which one part of the sleeve is made adjustable or laterally movable toward and from the crank or toward and from the hub, or, which is the same thing, toward and from the other part of the sleeve, and so constructed that the entire strains of the load

and the end thrust are taken upon the balls and the beveled bearing surfaces and the plain cylindrical parts of the bearing entirely relieved and the friction entirely converted from rubbing into rolling friction and the mechanism of the bearing parts operating for a constant restoration of relative position to compensate for wear. In doing this Wallace took from the prior state of the art the spherical roller, which was the most perfect form of roller, for the purposes of his mechanism and the four beveled bearings of Peters, with the division between axle devices and hub devices substantially midway of the rollers, which were the most perfect interior devices for
240 holding the spheres in his mechanism and the most perfect arrangement of bearing surfaces for them, and made substantial modifications and improvements in the construction and combination of these devices, and thus produced a most practical, successful, and perfect anti-friction bearing for the front wheel of bicycles; in fact, he made the first practically successful single-row ball bearing for velocipede wheels. The differences between his structure and the previous structures referred to by defendant's experts I have, in part, previously pointed out; and for reasons which I have already given I consider the opinions of defendant's experts, that the previous patents and state of the art so limit the necessary meaning of the second and third claims in the Wallace patent No. 1 that they do not cover the defendant's devices, are erroneous.

Recess until 2 o'clock p. m.

Resumed.

I note that defendant's experts compare the previous patents with the second claim of Wallace patent No. 2 and fail to find any invention pointed out therein, and that defendant's expert Powers rather obscurely alleges that defendant's machines do not contain the invention of the second and third claims of the second Wallace patent, because they are old, and also because he is pleased to call the flange with a toothed edge and the device for stopping it between the hub and the bearing box in defendant's machines "a ratchet wheel and pawl," whereas Wallace calls them a serrated annulus and a locking button; but these points and conclusions are, in my view, not well taken and are unsound, partly for the reasons that I have already given in comparing these prior patents with this
241 second Wallace patent and partly because under whatever name may be applied these devices in the second Wallace patent, second claim, operate in substantially the same way to accomplish substantially the same result as the corresponding devices in the Wallace construction, and for the further reason as to the matter of invention that in my view there was a decided and distinct step in the advance of the art of bearing construction and a substantially improved mechanism for the purpose made by Wallace in the modification and reorganization effected by the changes from the construction shown in his patent No. 1 and the construction shown and referred to in the second claim of his patent No. 2 and duly embodied in the Expert Columbia Exhibit and the Cham-

pion and Light Champion Exhibits. Not only the milled annulus and the locking button, but the arrangement of the space for adjustment and the movable cone and its operating and locking mechanism on the wheel side of the bearing box, was important, enabling a more convenient and effective construction of these devices, avoiding objections to the other form, and enabling a more compact construction or narrower "tread," the advantages of which I have previously referred to. If the reasons assigned by defendant's experts for non-infringement of the third claim of Wallace patent No. 1 were sufficient to take their devices out of that claim they would seem to me to be sufficient to bring them within the second claim of the Wallace patent No. 2. I have already pointed out my principal reasons for differing from their opinions as to the similarity of defendant's devices to those of the third claim of the Wallace patent No. 2.

Q. 45. Please look at the patents now shown you:

242 Defendant's Exhibit Harris 1875 Saddle patent,
" " Schmidt 1871 " "
Defendant's Exhibit Lamplugh & Brown 1878 " "
also Defendant's Exhibit Curry 1867 Saddle Patent, and compare the mechanisms shown and described in each of said defendant's exhibits with the mechanisms shown and described in Complainant's Exhibit Shire Patent, and especially made the subject-matter of the second claim therein, pointing out their similarities and differences, and also give your reasons for such opinions as you may express, and also your reasons for any differences you may find between such views as you may express in reference to these mechanisms, and the opinions or views you find expressed by the defendant's experts in regard to the similarities and differences of these mechanisms, if there be any differences between your opinion and those of said defendant's experts.

A. In order to understand correctly a Shire patent, second claim, and the construction therein referred to, and the differences between the Shire structure and the structures of these prior patents, it is important to take note of the class or classes of machines to which they relate and of the structures commonly known in the art of velocipede construction at the date of the Shire patent. It is partly by reason of a different and perhaps a fuller and better understanding of these things that I differ from some of the views expressed by defendant's experts on the matters inquired of. The three exhibits, Harris, Schmidt, and Curry patents, referred to relate to horse saddles, a class of saddles in which, so far as the seat portion for the rider is concerned, it is not material whether it be less or more backward or forward, or less or more distance vertically

243 from the under mechanism, or whether it is wide or narrow, or whether it is adjustable vertically or adjustable fore and aft—that is to say, not in any specific sense or within any narrow or special limits. It is a class of saddles to be used or ridden upon with the knees spread, it admits it a high and broad pommel, and the matter of reach or distance between the seat portion and the stirrups for different heights of rider is arranged by raising and

lowering the stirrups and has no relation to the question of size or height of the horse or machine which the rider may be capable of using it with; whereas the contrary of all these things is true with regard to bicycle saddles, which are required to sustain certain relations to the axle and pedals of the driving wheel and steering head, have to be ridden substantially without the pommel, with the legs of the rider brought nearly together at the seat, are required to permit a fore and aft change of position of the rider thereon, and in the construction of which it is material whether there is vertical or longitudinal adjustment of the seat, and whether and what spring supports there are to relieve the rider from the jar of the machine, and how they are to be arranged with respect to the seat, all within certain limitations and requirements of the construction of the velocipede and the physiological requirements of the rider, which do not exist in horse saddles. It does not need to be pointed out that the devices for attaching and supporting the seat mechanism in velocipede saddles are necessarily different from the corresponding devices in horse saddles, but it may be observed that the saddle mechanism of a velocipede includes not only the seat proper but the supports and attachments of the same upon the frame of the velocipede.

244 The velocipede saddles most commonly in use prior to the Shire patent consisted of a seat having a metal frame or plate, in the oldest form, and sometimes a wooden frame or plate, as in the Ambler patent, having somewhat the shape in the top *plain* of the section of a pear with the stem end forward, padded on the upper side and with a covering of hogskin or other leather fitted and stitched snugly over it, and mounted on a leaf-spring plate by means of two short balls near the middle of the under side of the saddle, arranged to drop one on either side of the spring, the saddle being held by a short metallic bar or clamp and nuts on these bolts firmly to the spring, and the spring was attached to the perch of the bicycle by a bolt through the neck and through loops in its forked forward end and by a fixed loop clip on the perch at its rear end. Such a structure for the purposes of illustration I produce, and a glance at this and at the ordinary riding-horse saddle will be sufficient to attest the correctness of my discrimination between the two classes of saddles.

Counsel for complainant offers in evidence the velocipede saddle last described and referred to by the witness and requests that the same be marked for identification "Complainant's Exhibit Illustrative Velocipede Saddle No. 1." (And it is so marked.—L. G. F.) Objected to by counsel for defendant as new matter and not representing the facts.

I also produce for the purpose of illustration and better understanding of the Lamplugh & Brown patent referred to a bicycle saddle made by Lamplugh & Brown under the Defendant's Exhibit Lamplugh & Brown 1878 Saddle Patent and known in the market as a suspension saddle.

Counsel for complainant offers in evidence the saddle last
245 produced by the witness and requests that the same be marked "Complainant's Exhibit Illustrative Velocipede Saddle No. 2." (And it is so marked.—L. G. F.)

Objected to by counsel for defendant as incompetent and as not being a correct representation of the fact asserted as new matter.

I also produce for a purpose of illustration and better answering the inquiry respecting the differences between these prior patent mechanisms and the Shire mechanism a model velocipede made at my request by Mr. Newell, mechanical engineer and model maker, and which I believe faithfully represents the Shire mechanism.

Counsel for complainant offers in evidence the model velocipede last referred to by the witness and requests that the same be marked "Complainant's Exhibit Illustrative Velocipede Saddle No. 3." (And it is so marked.—L. G. F).

Objected to by counsel for defendant as incompetent, as new matter, and as not correctly representing the saddle or seat block of the Shire patent more especially.

The patent, Defendant's Exhibit Lamplugh & Brown, shows a saddle mechanism constructed with a metallic plate and a leather seat piece, but without padding and with the metallic part and leather part separated, the latter being attached to the former only at the ends by rivets in a stretched position, as shown in the model No. 2, which I have just now produced.

Adjourned to 10 o'clock a. m., October 3, 1887.

OCTOBER 3—10 a. m.

Resumed.

This saddle of the Lamplugh & Brown patent is what be-
246 came known in the trade as a "suspension saddle," and which is a well-known variety of velocipede saddle, but it belongs to the class of plate or tree saddle and only differs from the ordinary hogskin saddle as shown in "illustrative saddle No. 1" in having the leathern seat and the main plate separated and the former stretched upon the latter. In all the figures and throughout the description of this patent the saddle proper—that is, the leathern seat and the under plate—is of the same construction as shown in the figures 1 to 5, inclusive. This under plate is provided with two short bolts and nuts and a clamp for attachment to a leaf spring above the backbone as shown in illustrative Exhibits Nos. 1 and 2. In figures 6 and 7 of this patent, however, is shown a form of attachment to the velocipede in which the bolts and clamps at the middle part of the under plate are dispensed with, and a loop is attached to the front end of the under plate, and a bracket is attached to the rear end of the under plate, and both secured to the perch and neck so that the under plate and the whole saddle is supported at its ends instead of at its middle part. This armature differs *toto cælo* from the Shire structure in that, first, it is not a hammock seat at all, and, secondly, it is not an adjustable hammock seat. I note

that Mr. Jeffery says in his answer to question 41 that this Lamplugh & Brown invention dispenses with the rigid plate, and that the nuts and bolts show devices by which its height may be adjusted, and that the screw and shackle in figures 6 and 7 are to stretch the leather, and upon these malobservations of the facts he founds an opinion that this seat is "exactly the adjustible saddle seat 'J,' claimed to have been invented by Shire." Instead of dispensing with a rigid plate Lamplugh & Brown simply make the rigid plate more concave and dispense with the padding. The
247 nuts and bolts, instead of operating in any way to adjust the length or height of the seat piece, serve simply for securing the saddle by its plate to the substantially horizontal spring and to permit the securing of the whole saddle, including the plate, in different positions fore and aft, and the screw and shackle in figures 6 and 7, if operating to stretch anything, could only stretch the metallic plate to which they are attached. In the Shire device every form of under plate, as well as padding and central attaching devices, is removed from between the leathern seat and the frame of the bicycle. The leather seat piece is attached at its ends only to projections from the frame, and has in it or connected with one end a means of taking up and letting out its length and of adjusting the middle part on which the rider sits toward and from the axle of the front wheel and the foot cranks on it or, in other words, varying the reach for the rider.' For these reasons the opinion of Mr. Jeffery is, in my opinion, erroneous. I note that Mr. Powers does not express any opinion in this respect, but his observation that the extensible screw device, as he calls it, shown in figures 6 and 7 of this patent allow- the seat to be raised and lowered substantially the same as the seat of Shire is erroneous, as is obvious from inspection as well as from the construction of the devices, since there is shown no hinge, link, or yielding device whatever; but the screw operates in a horizontal direction only, and neither the front end nor any part of the seat can be any lower or higher, practically, whether the screw be taut or slack.

Exhibit Curry 1867, Schmidt 1871, and Harris 1875, each of them, belong to the class of horse saddles which I have differentiated al-
248 ready from the class of velocipede saddles and from which it is not practicable to transfer or substitute from either class into the other of the component parts without substantial modifications. Each of these three exhibits shows also saddles of the under plate tree or frame variety. The Exhibit- Curry and Schmidt show suspension seats in this respect—that they have either webbing or leather as part of their construction to support the seat pieces attached at the ends to pommel and cantle and separated from the rigid parts of the tree, but in this respect they show no nearer approach to the Shire than the Lamplugh & Brown saddle. Exhibit Harris might also be considered to show a similar suspension construction if the pieces "*a*" "*a*" were to be regarded as of leather or textile fabric, but as I understand it, though they are not fully described in the patent, they are metallic pieces constructed so to hold their shape and are designed to have a leather seat piece, which, as the patentee

says, he prefers to "quilt"—rest—upon them. In neither of these three exhibits is there any suspension part having means of extension or contraction, raising or lowering, or otherwise adjusting; in neither of them is there any hammock construction—that is, any construction in which the leather seat piece is attached and suspended from its ends only and without any tree, frame, or plate, or attaching devices underneath the middle part and forming part of the saddle. The Harris patent shows a spring and loop at the pommel by which the front end of the pieces supporting the leather may be either connected or disconnected, but this spring does not in any view cut any figure in the matter of anticipation, because when it is connected with the loop it does not, as I have already pointed out, any more than doubtfully constitute a suspension seat, and when it is disconnected, as it is described it may be, it is certainly a
249 rigid seat. There are, as I have already pointed out, no devices whatever for adjustment, and Mr. Jeffery is in error in assuming that it is intended that the supporting pieces "*a*" "*a*" may be lengthened or shortened by filing out the rivets which connect them to the loop and placing them in other holes.

Q. 46. Please look at the following patents now shown you, Defendant's Exhibit Salamon 1879 Saddle Patents, Defendant's Exhibit Fowler 1880 Saddle Patent, Defendant's Exhibit Shire 1879 Saddle Patent, Defendant's Exhibit Miller 1866 Saddle Patent, Defendant's Exhibit Nelson 1860 Saddle Patent, and compare the mechanism in each of said defendant's exhibits with the mechanism shown and described in Complainant's Exhibit Veeder Patent and especially made the subject-matter of the first claim thereof, pointing out their similarities and differences, and also compare your views in relation thereto with the views of the defendant's experts and give your reasons for such opinion as you may express.

A. As I have already pointed out the construction of the Shire patent and the distinctive features of that saddle, I will refer to what I have before said and to the distinctive features of the Veeder patent for this part of my answer. The Veeder patent does not show a "hammock" saddle, but a different variety, although its distinctive features, as pointed out in the first claim, may well be incorporated into a hammock saddle, as they are in those of defendant's machines. It differs from the Shire patent in that, instead of having a strap and buckle or equivalent device in the leathern seat piece or flexible seat itself for adjustment, it has devices in the supporting mechanism operating positively to take up the slack of the flexible seat and increase the tension of the spring supports.

The adjusting devices in the Shire saddle, while sufficient
250 and operative for the adjustment *those* described and required, does not operate in the same way nor perform the same function as the adjusting devices in the Veeder saddle, in that in the Veeder contrivance the supports of the flexible seat are movable or extensible one from the other to take up the slack of the flexible seat piece occasioned by the weight of the rider in use and especially under moisture. Veeder shows these under supporting and adjusting devices as in two plates or springs, with a longitu-

dinal screw for positively forcing these supports from each other and so creating a tension in the flexible seat and the springs. For purposes of illustration I produce a model of the Veeder contrivance, one of several made before or about the time that the patent was solicited, showing the adjusting or tension piece as it is shown in the Veeder patent and referred to in the second claim. I also produce for illustration another form of saddle in use under that patent, showing the adjusting device in the same form of a longitudinal screw, but the connection of the two supporting parts of the flexible seat with this screw device in a little different form. I understand Veeder in his second claim to point out this construction, the screw being claimed in combination as an "adjusting bolt F′," and this form of the Veeder saddle or of the Veeder invention referred to in his second claim is found also, in substantially the same manner as in the two illustrative models just referred to and in the Veeder patent—is found in the defendant's machines, Exhibits Ideal Bicycle and Ideal Tricycle.

But I do not find that Veeder contemplates that this precise form of adjusting devices are necessary to the embodiment of his invention, which he says may be varied, and in his first clause of claim he does not point it out specifically, but does point out that
251 the under metallic parts may be extensible or separable from each other in any other manner so as to take up the slack of the flexible seat.

The Miller 1866 patent shows a horse saddle of the class that I have previously described, having a cast metallic tree having columns or upright pieces at the front and rear, to each of which is attached a spring, and these springs are connected with a seat frame made of cast or wrought metal, extending entirely fore and aft and on each side of the length of the saddle and supporting the metallic seat piece or covering. It differs from the Veeder construction in not having the flexible seat piece attached to springs or plates at either end only and supported thereby without metallic support or contact at its middle part beneath the seat of the rider, and also in not having any adjusting tension devices whatever.

The Exhibit Nelson 1860 patent shows also a contrivance of the same class of horses' saddles, having a metallic seat plate that is hooked by a non-elastic connection to the pommel or forward end of the saddle tree and fastened principally at the forward end. Beneath the middle part of this metallic seat plate and between it and the tree are placed two rubber buffers held by a slide running in ways so as to be adjusted beneath the plate for a short distance fore and aft, by means of an adjusting screw, so as to bring these buffers exactly under the sitting part of the rider's body when he is in the saddle. This device, as is obvious, differs from the Veeder device in every respect. It has no flexible seat piece supported at either end only and by attachment to extensible plates or springs, and as it has no tension of the flexible seat piece so it has also no means of adjusting such a tension; so it is not correct to say, as Mr.
252 Jeffery does, that this Nelson seat is composed of the same elements as described in claim 2 of the Veeder patent.

Exhibit Fowler 1880 Patent shows a velocipede saddle of ordinary construction, of the same variety as shown in Illustrative Exhibit No. 1—that is, having a metallic seat plate with a leather covering clamped near its middle part to a longitudinal leaf spring. This longitudinal leaf spring beneath the saddle is connected by a socket to the steering post and rests upon a coiled wire spring, and at its rear end is connected by a link to a metallic support upon the frame of the velocipede. The saddle in this patent is not at all in any conceivable feature a suspension saddle, as erroneously described by Mr. Jeffery, nor does it show either the devices or the combination referred to in the first claim of Veeder, because it does not have a flexible portion attached at either end to a metallic under spring in two or more parts, nor having such parts extensible, as there set forth.

The Salamon 1879 patent also shows and describes a velocipede saddle and supporting springs, but the saddle here described is a suspension saddle, having a metallic under plate in a single piece, to which the flexile portion is attached without means of taking up the slack, and supported near its middle part upon a longitudinal leaf spring in substantially the same manner as shown in Illustrative Exhibits No. 1 and No. 2. This under spring "*c*" is supported by link mechanism at either end upon rubber buffers or rubber rings held together by bolts. This device also differs from the Veeder device, as pointed out in his first or second claims, in that it does not have the under supporting spring or plate to which the flexile portion is attached constructed in two or more parts, nor any device by which such plates are extensible or by which the tension of the flexile seat may be adjusted.

253 I note that the defendant's experts endeavor to make it out that the longitudinal leaf springs in the Fowler and Salamon patents answer in some way to the construction of suspension seats, but by a clear perversion of language and a clear misunderstanding of the facts of connection referred to. These two patents show a suspension seat in no other sense than that the rigid saddle is fastened to a long steel leaf spring, which is supported at either end upon the frame of the velocipede, and in that sense the seat of Illustrative Exhibit No. 1 is exactly a suspension seat to the same extent. For these reasons the opinions of defendant's experts that the exhibits referred to in this question either anticipate or narrowly limit the invention of the Veeder patent are, in my view, erroneous.

Counsel for complainant offers in evidence the saddles referred to by the witness as illustrative saddles of the Veeder form and made under the Veeder patent and requests that the same be marked "Complainant's Exhibit Illustrative Bicycle Saddle No. 4;" also "Complainant's Exhibit Illustrative Bicycle Saddle No. 5."

Objected to as incompetent and as introducing new matter.

Adjourned at 12.50 until 2 p. m.

Resumed at 2 p. m.

Q. 47. Please look at the patents now shown you, namely, Defendant's Exhibit Fowler 1880 Saddle Patent, Defendant's Exhibit Veeder 1882 Saddle Patent, Defendant's Exhibit Bishop 1859 Saddle Patent, Defendant's Exhibit Miller 1866 Saddle Patent, Defendant's Exhibit Curry 1867 Saddle Patent, and Defendant's Exhibit
254 Duryea 1884 Saddle Patent, and compare the mechanism shown in each of said defendant's exhibits with the mechanism shown and described in Complainant's Exhibit Kirkpatrick Patent and made the subject-matter of the first claim thereof, pointing out their similarities and differences; also examine the model marked "Defendant's Exhibit Model Bishop Patent," and state wherein it compares with or differs from said Bishop patent, giving your reasons for such opinions as you may express, and point out to the court your reasons for any difference between such opinions as you may express and the opinions which you may find expressed in the depositions of the defendant's experts with reference to these same patents.

A. The saddle mechanism shown in the Kirkpatrick patent, No. 314,142, and referred to in the first clause of claim is not shown or described in the Veeder 1882 saddle patent because, although it has a flexile seat piece supported only at each end, and has also means in the supporting devices for adjusting the tension of the flexile seat and springs, yet the Veeder saddle patent does not show or describe the independent front and rear springs substantially as set forth in the Kirkpatrick patent. For further convenience of illustration I produce a hammock saddle made for use under this Kirkpatrick patent, and which shows the same construction as the patent, with the immaterial exception that this specimen has not the buckle at the front end, but instead has the strap turned over and riveted, and that the clip which holds the rear spring to the backbone has not the small independent set-screw marked "f^3" in the patent. I also produce another specimen of hammock saddle, also made under this Kirkpatrick patent, differing only from the patent and the other specimens just produced in that it has coiled
255 wire springs instead of bent flat springs. Both of these forms of the Kirkpatrick saddle have been made by the complainant corporation under the Kirkpatrick patent and are in extensive use on their bicycles.

It is to be observed that in respect to having a hammock seat—that is, having the flexile seat piece suspended at either end from projections from or attachments to the frame of the velocipede without the intervention between its middle part and the frame of the machine of any tree, frame, or metallic attachments whatever, and also in respect of having devices for raising or lowering—that is, adjusting its middle part—it is like the Shire patent; and in respect of having devices in or connected with the metallic support of one end of the flexile seat for adjusting the tension of the flexile seat and the springs it is like the Veeder structure, too; but, unlike either of these devices in the previous patent referred to in the ques-

tion, it has springs at its front and rear end- and supporting the flxile seat from and upon the frame, which are independently attached to the perch and neck, have a vertical and independent action, and so are capable of and produce an independent action as well as have an independent location or position. In the art of bicycle riding—that is, the use of the machine in which this invention operates—the rider is subjected to what may be called fore-and-aft impulses by the obstructions to the fore and after wheels, which require for a perfectly efficient saddle mechanism some fore-and-aft yielding in the latter; but the principal impulses or strains to which the saddle is constructed to yield are vertical ones, and the principal yield of the saddle and its supporting mechanism must be a vertical one or substantially so; and in riding up grade the rider of
256 a bicycle, owing to the corresponding inclination of the mechanism to the line of the grade and the necessity of keeping his position for actuating the machine, takes a forward position on the saddle, and in riding down grade takes a backward position on the saddle for the same reason and for an added one of safe equilibrium, so that the rider's position on the saddle should vary several inches, perhaps an average of three or four; and to meet the requirements of these changes in position of the rider it is important that the front and rear spring supports of the taut-stretched flexile seat should have an independent vertical action in order to operate for all positions of the machine and rider as an elastic or yielding saddle mechanism.

The form and construction of this Kirkpatrick patent device differ from the Veeder patent device in having these two features of independent vertical action of the front and rear supports, and of independent position of these supports in their attachment to the perch or frame and the separation or removal of all supporting or attaching devices from beneath the middle part of the flexile seat and from between it and the perch. Defendant's expert, Jeffery, refers to the Fowler patent of 1886 and the Miller patent of 1866 and the Curry patent of 1867 as showing independent front and rear springs; but the saddle in the Fowler patent, as I have before pointed out, is a rigid saddle attached to a nearly horizontal leaf spring, which leaf spring also rests at its ends upon one or two other springs, and the Miller patent shows a rigid saddle plate in a horse saddle having springs at its front and rear end, and the Curry patent has a rigid metallic pommel and a rigid wooden cantle without any springs at all, so that neither of these three exhibits
257 belongs to the variety of either suspension or hammock saddles, nor has any spring, whether independent or not, combined with a flexile seat, nor any such elements or combination of elements as are claimed in the first claim of the Kirkpatrick patent. The Duryea patent referred to is a suspension saddle having a continuous under frame to which the flexile portion is attached at either end, substantially like that of the Illustrative Saddle Exhibit No. 2, except that the plate or under frame is formed of round wire instead of flat sheet metal, and is no nearer to the Kirkpatrick construction than the Lamplugh & Brown is. This Duryea saddle has one con-

tinuous spring extending from the front end to the rear end of the saddle and held to the perch near its middle part by loops and set-screws, forming a clip; consequently it has not separate springs to the front and rear end which are independent either in construction, position, action, or adjustment. Mr. Jeffery is entirely in error when he speaks of this single spring as forming two, and entirely misunderstands the facts and the construction when he says that the front part of this spring and the rear part may in the Duryea device be elevated and depressed independently of each other.

I come now to the Bishop 1859 saddle patent, on which stress is laid by both of defendant's experts as containing the construction shown by Kirkpatrick and claimed in his first clause of claim. Mr. Jeffery particularly describes this Bishop device as containing independent front and rear springs secured to a perch or backbone and a flexile seat suspended directly from said springs, and says the tree of the saddle performs all the functions in respect to the springs and the flexile saddle that the perch described by Kirkpatrick
258 does. To illustrate his understanding of the Bishop patent he produces this model, Exhibit Model Bishop Patent, made with a modern bicycle seat top connected by bicycle pieces to vertical springs exaggerated in length supported on a short block, and if he had gone a little further and made those springs of different curvature and action and attached by clips to a bicycle perch he might have shown a little more completely his ingenuity in endeavoring to construct a model that should look like a Bishop saddle and a Kirkpatrick saddle at the same time. In order to illustrate correctly this discussion of the relative construction of the Bishop patent I produce a model of this Bishop structure made at my request by Mr. Newell, mechanical engineer and model-maker, to be exactly like the patent and which does faithfully represent the patent, so far as I can see. This Bishop patent shows a saddle seat piece, "C," which, he says, may be constructed of leather or of anything else with a leather covering. If made of leather it would be a flexile seat, broad at either end, without tension or any means for adjusting tension, supported at either end by what he calls an upright elastic steel bar, through an eye in which a loop passes, connected with the seat piece, in order to get what Mr. Bishop is driving at, namely, a free rocking motion with a little elasticity in the upright bars. Now, it is obvious on inspection that this patent does not disclose any such front and rear springs as are referred to in the Kirkpatrick patent, first claim. If by courtesy these upright bars may be called springs they are not independent in position and parts of the saddle constructed so as to be capable of or adapted for combination with the perch or backbone of a bicycle nor found in a saddle without a tree or under plate, and consequently are not, in the sense
259 of the Kirkpatrick patent, "independent" in position; they are not capable, by any appropriate use of the seat, of separate action, since one cannot be operated without operating the other, and so they are not, in the sense of the Kirkpatrick patent, "independent" in action; neither of them is combined with a perch or

otherwise connected by a movable clip or equivalent device, so that they can be separated in attachment or in their action upon the tension of the flexile seat and the springs, and so they are not "independent" in adjustment or attachment, substantially as set forth in the Kirkpatrick patent. I may add that I find no warrant in the Bishop patent for constructing the forward elastic upright bar bifurcated or of bent wire, as shown in this defendant's model exhibit referred to, nor for the construction of hook attachments, nor for the construction of the flexile seat piece adapted for a bicycle seat, nor for the construction of the rear supporting plate to which the hook is attached, nor for some other points of construction, but they do not seem to me very material, as it is obvious that even had a saddle been constructed like this Defendant's Exhibit Bishop Model at the date of the Bishop patent it would not have been like the Kirkpatrick device, nor anticipated his first clause of claim, and it is obvious that the actual Bishop saddle is much farther off from it, and that neither the Bishop saddle nor any of its elements could be substituted in a bicycle structure without material changes.

For the reasons I have given, the prior patents referred to in the question do not anticipate the first claim of the Kirkpatrick patent nor so limit its construction as not to cover the defendant's devices, in my view, and the opinions of defendant's experts thereon are erroneous.

260 Counsel for complainant offers in evidence the saddles referred to by the witness and requests that the same be marked "Complainant's Exhibit Illustrative Velocipede Saddle No. 6;" also "Complainant's Exhibit Illustrative Velocipede Saddle No. 7;" also "Complainant's Horse Saddle Exhibit No. 8."

Objected to by defendant's counsel as incompetent and as *as* introducing new matter.

Q. 48. Please look at the patents now shown you, Defendant's Exhibit Harrison 1877 Handle Patent, Defendant's Exhibit Settle 1881 Pedal Patent, and Defendant's Exhibit Jackson 1876 Pedal Patent, now shown you and compare the mechanism and devices shown and described in each of said exhibits with the devices shown and described in Complainant's Exhibit Latta Patent, pointing out their similarities and differences, and also the differences, if you find any, between your opinion in reference to the matters inquired of and those given by the defendant's experts in reference to the mechanisms of these patents, giving your reasons for such opinions as you may express.

A. The old form of pedal was a metallic block with an acorn-shaped weight on one side and a surface for the hollow of the sole of the rider's shoe on the upper side, and swinging on a pedal pin; then came Pickering and dispensed with the weight and made a three or more sided polygonal pedal to receive the ball of the foot, which went through some modifications. Now, this Defendant's Exhibit Jackson 1876 Patent shows a pedal formed, as an improvement upon the older methods, with a middle cylin-

drical part or barrel to enclose the pin, and two metallic arms or wings—one on either side of the barrel—consist-
261 ing of metallic bars, two on each side, set edgewise to the sole of the rider's shoe and with pieces of rubber held between these bars. Jackson shows these rubber pieces as suitable lengths of rubber tube forced between the bars and held by pins or rods, though he says they may be held otherwise. The rubber pieces afford to the rider's shoe—one on each side—a surface in the form of a cylinder, so that the rider's shoe would meet it, theoretically, on a line through its length, practically on account of the yield of the rubber something wider than a line, but forming one ridge or narrow contact for the shoe, one on each side the pedal pin. The Defendant's Exhibit Settle 1881 Patent shows a pedal of similar construction, except that the metallic wings, one on either side of the barrel of the pedal, consist of two parallel rods extending from one end plate to the other, and on each pair of these rods is a rubber block, molded in such shape as to present itself to the rider's foot in the form of a cylinder of small diameter, just as the Jackson device does, so that the shoe rests theoretically on a line and practically on something a little wider, one on each side of the pedal pin. In Defendant's Exhibit Harrison 1877 Patent is shown a modification of a pedal which had been itself modified from the structures I have previously described—that is to say, it had become common to some pedals having but one rod on each side the barrel and a plain cylindrical rubber box put on the rod on each side, such rubber bars being like this specimen which I now produce, with a round metallic rod running through the middle of it a little larger in diameter than the diameter of the hole through the middle of this rubber, as is the usual construction. Now, this figure, as in the Harrison 1877 patent, shows and refers to a construction of
262 pedals such as I have just described, with just such a cylindrical rubber bar as I have produced on each side of the pedal pin, affording a plain cylindrical surface or bearing to the shoe, except that this surface in the Harrison device is shown as serrated or having small longitudinal ribs pointed in cross-section on its cylindrical surface.

Adjourned at 5.15 until 10 a. m., Tuesday, October 4.

Resumed Tuesday, October 4, 10 a. m.

The Harrison patent device shows very slight grooves, but no surfaces between them. The Complainant's Exhibit Æolus Ball Pedal shows grooves more pronounced with surfaces between them over the curve of the cylinder.

Now, it will be noticed that in all these prior patents and devices referred to having a rubber bar each side of the barrel for the pedal pin the construction of the rubber is cylindrical with equal thickness between the metallic rod on which it is supported and the shoe of the rider as elsewhere, and the shoe presses through the rubber directly upon the metallic rod and on the rubber on one line of bearing each side of the pedal. The patent of Latta, however, shows

and describes and refers in the second clause of claim to a different construction of pedal, in that it has each side of the barrel a rubber pedal bar provided with a central longitudinal groove having two bearing surfaces for the sole of the shoe, one each side of the groove, and, as the whole bar is not cylindrical but polygonal in general shape, whichever side of it is presented to the rider's foot the shoe meets this construction of two bearing surfaces and a longitudinal groove between them on each pedal bar. This feature of construction is not found in either of the prior patents or devices.

263 In the third clause of claim the Latta patent points out the improved construction of a rubber pedal bar provided on each of its sides with a longitudinal groove and two bearing surfaces on opposite sides of the groove, whereby the bar is adapted to receive the pressure at its sides or edges—that is, on these bearing surfaces each side of the groove—and be compressed on opposite sides of the rod, thus pointing out another feature of the construction of the Latta pedal bar which is not found in either of the prior patents or devices, namely, that the rubber beneath the tread of the rider is not compressed directly upon or against the metallic rod through the rubber bar, but is compressed on either side of it, causing a broadening grip under pressure or a suction grip, which is very important in the use of the pedal, as it prevents the foot of the rider from slipping off of the pedal more effectually than any other construction yet devised. For the reasons I have given the conclusions of the defendant's experts, that the Latta patent device is without invention or of doubtful utility, are, in my view, erroneous.

Complainant's counsel offers in evidence the rubber pedal bar and rod referred to by the witness in his last answer, and requests that the same be marked for identification "Complainant's Illustrative Model Exhibit No. 9."

Objected to as incompetent and as introducing new matter.

Q. 49. Please look at the Defendant's Exhibit Illston 1879 Handle-Bar Patent and compare the mechanisms therein shown and described with the mechanisms shown and described and made the subject-matter of the claims in patent marked "Complainant's Exhibit Benham Patent," pointing out their similarities and

264 differences, and also compare the handle-bar mechanisms of the defendant's machines with the defendant's Jeffery patent marked "Defendant's Exhibit Defendant's Handle-Bar Patent," giving your reasons for such opinions you may express.

A. The Illston patent referred to and the Benham patent both show devices and construction of parts for the attachment of handle bars to the steering heads of bicycles, and both show how sleeve nuts upon the handle bars and operating upon projections from the steering head may be used as part of the construction for securing the two together, and so far they are in a general way alike; but they differ very materially in other respects, so that neither the structure nor the combinations in the Illston contrivance are the same nor substantially the same as in the Benham.

In the first place, the construction of the handle bar is materially different in the two; secondly, the construction of the steering head is materially different; thirdly, there is no detent in the Illston and there is in the Benham; and, fourthly, the combination of modified devices in and connected with the steering head and its legs and the handle bar and its attaching devices are not the same and do not operate in the same way to accomplish the same results.

The handle bar of Illston is substantially in three parts or a middle part and two end parts, which in a solid handle bar might be wrought out of the same bar of steel, perhaps, at excessive expense, but would naturally be made of three parts welded together, and in the case of hollow or tubular handle bars would require to be made of three parts. The end part- of the handle bar of Illston are of plain cylindrical form, and the middle part is formed with two flattened straight sides and a projection or offset and
265 with two ribs or shoulders presenting perpendicular faces toward the middle and tapering or conical faces towards the end. This middle part between the handle bars proper is polygonal in shape instead of cylindrical; is smaller in one diameter and larger in the other diameter than the handle bars or end parts, as shown clearly in figures 2 and 5 of the Illston patent. On the other hand, the Benham patent shows a continuous cylindrical one-part handle bar, which Benham describes in his specification may be either solid or tubular, and which at its middle portion has no different or inserted piece of construction, but is plain, parallel-sided, cylindrical, continuous.

The upper end of the steering head in Illston patent contrivance is formed with a handle-bar lug consisting of one lateral projection on either side, exteriorly threaded, and one forward projection in front and a transverse parallel-sided, nearly vertical, slot cut through these parts and extending into the steer-head, so as to leave a single projection in front, which he calls a "bracket, A," and into this polygonal slot the polygonal middle part of the united handle bars is dropped and fits.

In the Benham patent structure the upper end of the steering head is constructed with a projection on either side constructed with a shoulder and an exteriorly threaded portion adjacent to the shoulder and with two forward projections, "*e*" "*e*," in front, with a "horizontal slot or opening through it at right angles to the vertical axial line of the steering head, which I make of just sufficient breadth to allow of the introduction of the handle bar, or, in other words, of about the breadth of the diameter of the handle bar, and also with jaws, '*e*' '*e*.'" Now, neither these jaws nor this slot or opening are found in the Illston patent.

266 In the Illston contrivance, owing to the separate and peculiar construction of the middle portion, with its cut-out on the lower side and its projection or extension on the other side, there is no detent for locating the united handle bars centrally or for holding it from revolving in its position, while in the Benham patent there is a detent, "D," attached to and projecting from the

cylindrical handle bar and projecting into a slot, "d^1," in the steering head.

The sleeve nuts in both the devices operate substantially in the same way and for the same purpose, so far as their separate action is concerned, but the combination of these parts which I have pointed out does not operate in the same way to perform the same thing or accomplish the same result in the two devices, because, whereas the combination in the Benham patent accomplishes the objects there pointed out, one of which is to obtain "a secure and detachable handle bar in one continuous (that is, uninserted, unwrought, unmodified, plain, cylindrical) piece, easily and securely fixed in position, whether the bar be solid or hollow, curved or straight," on the other hand, the combination in the Illston patent does not accomplish or attain these objects at all, but it is complicated, difficult, and expensive for a solid bar and wholly impracticable for a continuous hollow bar.

In my view, therefore, for the reasons found in the facts of comparison which I have pointed out, the Benham patent fully shows and describes and points out in the claims substantially different devices and combinations from those of the Illston patent.

The Jeffery patent referred to shows a modified device for
267 use in attachment of a handle bar to a steering head, and also a modified device for attachment of a brake lever to a handle bar and steering head. The manner in which Mr. Jeffery shows, describes, and carries out his so-called improvements is well pointed out in the claims, the first clause of which reads: "The bicycle head, having its lugs grooved and conforming to the handle bar, in combination with the loops embracing both and provided with impinging or contacting screw, substantially as described, for the purpose as set forth." The second claim is for "the combination of the loop or eye, handle bar, projecting open lugs, and a clamp, independent of either, but securing all, substantially as and for the purposes described." The third claim is for a device for attaching the brake lever, which I do not understand to be inquired of.

It is to be observed that in the structure shown as well as in the claims Mr. Jeffery adopts the same continuous, undivided handle box, the same horizontal slot at right angles to the vertical axial line of the steering head, the same jaws and projections from the handle-bar lug as Benham shows and claims, but in place of the sleeve nut of Benham on either side of the head Jeffery describes and claims a "loop" or unthreaded sleeve embracing both the handle bar and the projection from the lug, and having in one side of it an impinging or contacting screw, which impinges against the projection from the lug in one side of the loop or sleeve and draws the other side of the loop or sleeve against the handle bar. He shows and describes two arrangements of this clamping screw in the sleeve. In the defendants' machines, Exhibit-Champion and Light Champion, this patented device or combination is not used, there being in the device of these machines no "impinging or con-
268 tacting screw" nor any "clamping screw E" in either form shown or described in this patent, but there is a sleeve on

either side the steering head which, when the handle bar is placed in position, is moved or forced upon the projection from the handle-bar lug, so as to hold the handle bar and lug together, and which, instead of being threaded as the Benham sleeve is, is split on one side and has a contacting screw to tighten it, this device, as I have previously pointed out, being an equivalent of the Benham sleeve.

Adjourned at 12.35 — m. until 2 p. m.

Resumed at 2 p. m.

Q. 50. Please look at the "Defendant's Exhibit Harrison 1877 Handle Patent" and compare the mechanisms therein shown and described with the mechanism shown and described in the patent marked "Complainant's Exhibit Moran Patent" and made the subject of the claim thereof, pointing out their similarities and differences and also any errors that you find in the testimony of defendant's expert witnesses in reference thereto, giving your reasons for such opinions as you may express.

A. The Harrison patent referred to in the specification describes, as a fourth part of his invention, "a sheath or glove of India rubber, cloth, or other soft material to fit closely on and partly or entirely cover the handles of bicycles or tricycles." He also states that these sheaths or gloves are of two thicknesses of material, the space between which may be fil-ed with air. Again, he says "figure 3 represents the fourth part of my invention. A is smaller than D when it is pressed within D. There is air space C C which is filled with air by tube E," and figure 3 in the drawing apparently represents a section of such a glove and shows by a dotted line how
269 the part "A" would look drawn outside of "D." But the reference letter "D" is not shown in the drawing, figure 3. Now, this removable rubber and air mitten which constitutes the fourth part of Harrison's invention obviously differs from the mechanism shown in the Moran patent by being completely abreast from the latter. In both India rubber is used, but in Moran it is a constituent part of or constitutes the handle, and in the Harrison patent the rubber forms simply a glove to draw on the handle. With the Harrison glove on a bicycle handle there would be presented a rubber surface to the head, and so would the handle of Moran; but neither of these are features of the Moran patent as pointed out in the claim, and this Harrison device would not, in my view, anticipate either clause of the claim of Moran, and that I don't find any clear reason or opinion of defendant's experts that it would; but Mr. Jeffery seeks further from this patent to find the Moran device.

That part which I have above quoted and pointed out is all that Mr. Harrison describes or explains about the fourth part of his invention or concerning a rubber handle; but in his numerous figures of drawings are figures 4, 5, and 6, which he says represent all the same form and construction of handle except as to the surface, the surface of figure 4 not being described, the surface of figure 5 being described as fluted, and the surface of figure 6 being described as diamonded. As to figure 4 he says: "Figure 4 represents a solid

rubber handle, which can be made in any form; A A is solid rubber; B B is the wood or vulcanite on which the rubber is placed. The wood B B must be of different shapes and sizes to suit different sizes of hands, which will of necessity alter the shape of the rubber; D shows end view of handle." On turning to the drawing figure 4 does not show any more definitely or fully the construction of the handle than the words I have just quoted, but seems to be somewhat in conflict. The drawing shows in the main or top part of the figure an outline which might indicate the handle in top plan. It also shows three vertical lines nearly through the middle which might indicate a seam on the rubber envelope, or, as they appear to be lettered with the letters B B, they may indicate the wood on which the rubber is placed; if the latter, then they would indicate that the wood was substantially a straight, parallel-sided, hexagonal piece, extending nearly through the handle, and it is difficult to understand how the shape or size of this interior wooden piece is intended to be varied in size or shape so as of necessity to alter the shape of the rubber as described. Again, the lower part of figure 4, marked "D," and which is said to show an end view, is drawn with section marks or shading lines and is of the same diameter as the largest part of the upper portion of the figure and might be taken for a section of the handle through its larger part. In that case it does not show the wood B B, or else it shows that the whole handle is of wood, and that the rubber is to be stretched over it in the form of a glove, as in figure 3, or, on the other hand, if, as the specification reads, it is to be taken as an "end view"—that is, as an end elevation of the larger end, which it must be, from its diameter—it shows that the hole for the handle bar extends completely through this handle. As the corresponding parts of figures 5 and 6 are marked "cross-section," and this is not, perhaps it is proper to take it, as expressed in the specification, to show an end view, and that the handle bar and the perforation for it does extend entirely through the handle.

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271 But however any one may be able to understand or construe these figures and the meagre references in the specification, or however this handle is intended to be attached to the handle bar (no construction as to this matter being shown or described), it is obviously not the same structure or mechanism shown in the Moran patent and described and referred to in the claims thereof. Moran describes his improved handles to be constructed for and attached to the ends of a velocipede handle bar in place of the ordinary handle bar—that is, of the horn or wood handles previously used. The object of the invention is to provide a device for counteracting the jar on the hands in traveling and preventing injury to the machine in falling. The handle is made in the general form of a ball and neck, the ball being at the outer end, which is nearly spherical in shape, and with the handle bar extending through the neck and into the ball, but so as to leave a thick and substantial cushion of rubber at the end of the handle and inside of the handle bar. In each of the several forms shown and described in the Moran patent there is a screw-thread on the handle

bar end fitting a screw-thread in the handle or a nut made therein, or else equivalent devices to form a positive attachment of the handle to the handle bar, and the patentee says that the handle may be vulcanized on. He shows his device adopted for use on velocipedes as then constructed, with long slender tongs formed on the handle-bar ends, and shows a wooden sheath, stem, or core in the neck of the handle on the tong. This handle of Moran presents in its combination with the handle bar and in itself differences from the structure of Harrison, so far as I can make out what Harrison's structure was, in these respects; it is different in
272 form in having the outer end shaped like a ball or substantially spherical in shape, and with its larger diameter carried nearer to the end, and in having a pronounced difference in size between the ball and neck, and the latter made longer; it is different in construction, in that it does not have the hole for the handle-bar end, nor the handle bar itself extend through the handle, nor substantially through it, but does have a smooth, spherical surface for the hand at the end, and a thick, substantial cushion of rubber at the end to relieve not only the hand from jar when ridden, as is the common way, with the palm of the hand on the end of the handle directly, as well as when it is above the end, but also the machine from injury in falling, and also in having a positive internal means of attachment in the handle to the handle-bar end.

In my view, defendant's expert, Jeffery, is in error in his stated understanding of the meaning of the claims of the Moran patent because he assumes that they require a core or non-elastic center in the device in each one, and because he assumes that the first and second clauses of claim refer solely to the handle and not to the handle bar "A," provided or combined with his improved rubber handles; he is also in error, in my view, in saying that there is no invention in the Moran structure, if by that he means there is nothing new in the act.

Q. 51. Has the complainant corporation ever, by agreement or tacit consent, relieved the defendant Gormully or his associates from the obligations of his agreement No. 3, wherein he acknowledged the validity of the Moran patent and agreed to make no device or invention secured by said patent other than according to the permission or conditions in paragraph numbered "first" in said agreement, whereby there would be any right or au-
273 thority to continue the manufacture and use of the said Moran handle after the discontinuance of the payment of royalties by the said defendants under the Gormully licenses?

A. No; it has not.

Adjourned *to* 5 p. m. until 10 a. m., Wednesday, —— 5, 1887.

Resumed Wednesday, Oct. 5, 1887, 10 a. m.

Q. 52. It is stated by the defendant's expert that they do not find in the defendant's Ideal tricycle certain bevel wheels and other devices shown in the Whitehead patent. Please state how the defend-

ant's Ideal tricycle, with respect to those differences pointed out between it and the Whitehead patent, compares with the Columbia tricycle and Victor tricycle, referred to in agreement No. 3 as containing the Whitehead invention and as being a structure which defendants would not make, and also examine the patents referred to by defendant's experts as in some manner anticipating the Whitehead invention, namely, "Defendant's Exhibit Taylor English Patent, No. 2548;" also "Defendant's Exhibit Hawksley English Patent, No. 2296," and the Clark English patent, No. 1728, and compare said structures shown in said patents with the devices shown and described and made the subject-matter of the claims in the Whitehead patent, pointing out their similarities and differences, giving your reasons for such opinion as you may express.

A. Defendant's experts point out that the defendant's Ideal tricycle "does not have any axle, D *d*," saying so, I suppose, because the corresponding axle in the defendant's machine, namely, the one which has the driving wheel fixed to revolve with it and on the right-hand side of the machine, does not stop in the middle
274 of the machine, as it does in the Whitehead patent structure, but extends across the machine to the left-hand side and has the part corresponding to "*d*" extend through the tubular axle or hub of the left-hand wheel. In this respect it is exactly like the construction of the Victor tricycle referred to, and is, moreover, in my view, an equivalent construction to that of the contrivance shown in the Whitehead patent. They also point out that the defendant's Ideal tricycle does not have bevel wheels "E" "F" of the Whitehead contrivance, but spur wheels or straight-toothed wheels instead, one being connected with or fast to the axle of one driving wheel and the other to the other driving-wheel hub or tubular axle or bearing, by which it is freely connected with the other axle and wheel, so as to revolve independently, and in these respects the defendant's construction is exactly like the Victor tricycle construction referred to and is an equivalent, in my view, for the construction shown in the Whitehead contrivance. They point out that defendant's machine does not contain the intermediate bevel wheels with axle perpendicular to the axles of the driving wheels, but in place thereof spur wheels having axles parallel with the axles of the driving wheels, and in this respect also the defendant's construction is exactly like the construction of the Victor tricycle referred to and, in my view, is equivalent to the construction in the Whitehead contrivance, because these intermediate spur wheels co-operate with the main spur wheels just as the intermediate bevel wheels in the Whitehead contrivance co-operate with the main bevel wheels to distribute the motion and the power of the master wheel to the driving wheels through their respective independent axles for the same purpose, in the same manner, and with the same result
275 as set forth in the Whitehead patent. They also point out that there is no intermediate cog wheel "K" of the Whitehead patent in defendant's machine, but, on the contrary, as is correct, that the wheels corresponding to "L" and "H" of the Whitehead patent contrivance are located on the side of the machine instead of in the

middle, and are connected by an endless chain for communicating power and motion instead of having an intermediate wheel in train; but in these respects also the defendant's construction is exactly like the Victor tricycle referred to, and in respect of the endless sprocket chain, instead of the intermediate wheel in train, is exactly like the Columbia tricycle referred to and is a plain equivalent in both respects for the Whitehead construction.

I have examined the Defendant's Exhibits English Patents referred to, and believe I understand them. The Taylor English patent, No. 2548 of 1850, shows and describes a certain construction of portable or traction steam-engines in which there are two driving wheels, "G" "G," having studs or teeth attached to the interior of the tire to the fixed spokes of these driving wheels. Meshing with these teeth or interior toothed wheels attached to the driving wheel are pinions "U" "U," one on each side the machine. There are two inverted steam-cylinders, with connecting rods working half cranks upon a first-motion shaft, "L," which has fitted upon it spur pinions of several diameters, which are thrown into and out of gear by suitable means, with spur-wheels "N" "N" upon a second-motion shaft. This second-motion shaft is composed of a solid shaft, "P," and a hollow shaft, "P¹," bearing chain wheels "R" "R" at their outer ends and connected by driving chains to other chain wheels, "T" "T," on shafts bearing the pinions "U" "U," which [illegible] with the interior toothed wheels attached to each 276 [illegible]ng wheel. Thus, there are in this structure these things:

A first-motion shaft, "L," receiving motion from the cylinders; a second-motion shaft, "P" "P¹," composed of two parts; two driving chains, "S" "S"; two third-motion shafts bearing the pinions "U" "U," and two fourth or main driving axles, with the main driving wheels "G" "G" and the interior toothed wheels "V" "V" on them. The second-motion shaft "P" has on it a miter wheel, and the other part "P" has also on it a miter wheel, and between these two miter wheels "O" "O" is a third miter wheel, "O," with its axle at right angles to the shaft "P," and this construction enables a balance or differential motion of the driving chains. The balance gear or rest of three miter wheels, "O" "O" "O," in this patent are shown with three modifications, in two of which miter wheels are used and in one of which speed wheels are used to accomplish the same purpose.

Now, this structure or mechanism in this Taylor English patent is widely different from the structure or mechanism of the Whitehead patent, and would not be practicable if applied to a velocipede. The Taylor mechanism does not show or describe a master wheel provided with sockets at its hub, in which are journaled driving axles with bevel wheels and an intermediate bevel wheel, as set forth in the Whitehead patent and referred to in the first claim, nor does it show an organism consisting of two driving wheels with their axles, two bevel wheels, and one or more bevel gears intermediate between them applied to a master wheel by which the driving wheels are directly driven, as set forth in the Whitehead patent and referred to in the second clause of claim, nor any structure or organ-

ism answering to the improved velocipede of the construction
277 and operation set forth in the Whitehead patent, and referred to in the second clause of claim, nor does this Taylor construction, with its first-motion shaft, its double second-motion shaft, its two third-motion shafts, its two-chain and four-chain wheels, and its two main driving axles, and two main wheels, and two pinions, and two interior toothed wheels, present or substantially present the combination pointed out in the third clause of the Whitehead patent claim as the combination, with a master wheel having a bevel gear applied thereto, of the wheels "K" "L" and foot pedals "*l*" "*l*," substantially as described.

The Exhibit Hawksley English Patent No. 2296 of 1861 is a provisional specification only, without drawings, and describes what Hawksley proposes as improvements in traction and locomotive engines, the descriptive part of which is as follows:

"The two driving wheels of a traction or locomotive engine are fixed on separate axes, and the ends of these axes are received into and freely turn within the nave of a toothed wheel. On the axis of each driving wheel is a beveled toothed wheel. These beveled wheels gear into the opposite sides of one or more, and by preference more than one beveled toothed wheel, the axes of which are carried by the toothed wheel into the nave of which the ends of the two axes of the two driving wheels pass. Motion is given to this toothed wheel by means of a cog wheel or pinions on an axis driven by the engines. * * * It is not essential that the beveled toothed wheel should be on the axes of the driving wheels, as the driving wheels may be driven by pinions acting in toothed wheels fixed to the driving wheels, and the axes of the pinions may then receive motion in a similar manner to that above described
278 in respect to the axes of the driving wheels, in which case it will be desirable that the pinion axes should be hollow, and they and the cog or toothed wheel which carries the beveled toothed wheel or wheels turn on a fixed shaft or axis."

Adjourned at 1.45 until 2 p. m.

Resumed at 2 p. m.

Thus Hawksley suggests two ways of improving a traction-engine mechanism such as is described in the prior patent of Taylor, but does not show or describe either an improved velocipede or the mechanism referred to as constituting the invention or the combination pointed out in the second and third claims of the Whitehead patent. If this incompletely described mechanism be read into the Taylor patent or constructed into a traction engine similar to the engine described in the Taylor patent, it would simplify that structure to some extent, whether the first or second alternative suggestion of Hawksley be used, but it would not then exhibit either the specific master wheel, sockets, driving axles, bevel wheels, and bevel gear, applied substantially as described, referred to in the first clause of claim of the Whitehead patent or the structure of the second clause or the combination of the third.

The Clark patent No. 1728 of 1866 also shows and describes a locomotive traction engine in which there is is a main axle carrying two main driving or traction wheels free upon it, each of which has on its its inner side a circular rack, "*b*," fixed thereon; it has a first-motion shaft or crank shaft, "Q," driven by connecting rods from the two pistons, and on this first shaft are two loose pinions of different sizes, which may be engaged to revolve with the shaft by means of a sliding clutch, and these pinions meshed with two
279 toothed wheels "U" "U" on a secondary shaft having its bearings in the frame of the locomotive. One end of this secondary shaft carries a fixed pinion, "*d*," which meshed with the circular rack on one of the driving wheels, and on its other end a sleeve which carries another pinion, "*c*," meshing with the circular rack on the other driving wheel; upon this secondary shaft, "T," and its sleeve and between the toothed wheels "U" "U" is a differential gear, consisting of four miter wheels, of which one is on the secondary shaft, one on the sleeve, and two are intermediate, meshing with these and carried on a spindle transverse to the secondary shaft; thus this mechanism contains a primary crank shaft, a secondary shaft and toothed wheels connecting them, a differential gear, a sleeve or second part of the secondary shaft, two pinions, one on the secondary shaft and one on its sleeve, two circular racks, and two driving wheels and the main axle.

This mechanism differs from the mechanism shown and described in the Whitehead patent in that, first, it does not exhibit a master wheel provided with sockets in which are journaled driving axles, as referred to in the first claim of the Whitehead patents, and, secondly, in that it does not exhibit an organization consisting of two driving wheels, a divided axle containing the two bevel wheels, one on each part of the axle with one or more bevel gears between, substantially as referred to in the second clause of claim, not the combination of master wheel, bevel-gear wheels "K" "L," and foot pedals "*l*" "*l*," as referred to in the third clause of claim of the Whitehead patent; nor would it be practical to substitute the mechanism of the Clark patent into the Whitehead velocipede or any other tricycle without material and substantial changes
280 and modifications. It is true that in each of these three English patent exhibits there is shown or referred to the differential device of three bevel wheels or its equivalent, just as there are shown or referred to steam-cylinders and pistons and driving wheels and cranks and other common general elements of which the structure is made up, but I do not understand the Whitehead patent to describe or claim the differential device of three bevel wheels or its equivalent as his invention, or that either of his claims is limited to that; but I do understand his first claim to be for a master wheel having a hub provided with sockets to receive the inner ends of two main driving axles in the same axial line, bevel wheels, one on each of said driving axles, and a bevel gear journaled in the master wheel so as to be carried with the master wheel and to drive directly with a differential motion both driving wheels, substantially as described in his patent; and I understand the sec-

ond claim to be for an improved velocipede mechanism or organization in which the seat and foot cranks, driving wheels and their axles, bevel wheel and bevel gear, master wheel, crank shaft and connecting mechanism are parts of the organization; and I understand the third claim to be for a combination, as a distinct driving mechanism in a velocipede, of a master wheel and its hub and bevel gear, foot pedals, crank shaft, and connecting train, or their equivalents, in a velocipede; and neither of these things nor anything substantially like them are found in either of the prior patents referred to. For these reasons I am of opinion that these prior patents or the devices shown in them neither anticipate the Whitehead patent nor show such a state of the art that the claims of the Whitehead patent, and particularly the second and third
281 claims, should be so limited in construction as not to cover substantial equivalents like the defendant's Ideal tricycle, and this especially in view of the fact that Mr. Whitehead was the first in the art of velocipede construction to produce a velocipede having any differential or balance driving mechanism allowing the outer driving wheel to rotate at a higher speed than the inner one in describing a curve without affecting the movements of the foot pedals or other actuating devices and so that both the main wheels are connected with a driving mechanism, as set forth in his specification.

Q. 53. Did the firm of Gormully & Jeffery advertise that the machines made by them were made under a license from complainant corporation; if so, how extensively, if you know?

Objected to as not calling for the best evidence.

A. Yes; they did so advertise in the "Bicycling World," a weekly paper published in Boston, Massachusetts, from May 9, 1884, to August 15, 1884, inclusive, and also in "Outing," a monthly magazine, published in Boston, Massachusetts, in the numbers for August, September, October, November, and December, 1884, and for January and February, 1885. I have not looked for other advertisements.

Q. 54. Do the ball bearings which are shown, illustrated in Gormully & Jeffery's catalogue of 1884, differ from the ball bearings now made by them in the American Champion and American Light Champion; and, if so, in what respect?

A. They do differ, as distinctly shown on page 4 of this catalogue, and in the sectional cut at the lower right-hand corner of the page, in these respects: they have no devices for adjustment, and
282 the balls run in grooves in the box and on the axle, which is in cross-sections, shaped on the arcs of circles of substantially the same radius as the balls and entirely enclosing the balls. The groove on the axle is contained partly in a sleeve fixed to the axle and butting against the hub, and partly in an elongated crank boss which is fixed to the axle by a key on the under side so that it cannot be moved. The bearings in defendant's Champion and Light Champion, as I have before described, are constructed for the balls to revolve on substantially conical surfaces or inclines in the box and on the axle, and those on the axle are on a two-part sleeve, one

part of which is adjustable or movable toward and from the other by a screw-thread.

Cross-examination by C. K. OFFIELD, Esq., counsel for defendant:

C. Q. 55. Do you know who put in these several advertisements which you say are the advertisements of Gormully & Jeffery?

A. Not in the Bicycling World.

C. Q. 56. How about the Outing?

A. I think I did have personal knowledge of the advertising in the Outing, as I was connected with the magazine at that time, and that it was duly authorized by the firm of Gormully & Jeffery and paid for by them.

C. Q. 57. Whatever advertisement appeared in the Outing, as you have described, professing to be from Gormully & Jeffery announced the fact that their main or driving wheel ran on ball bearings, did it not?

A. I don't so recollect it. As I remember it, their Ideal bicycle was there advertised, and usually had plain bearings. They did advertise to supply ball bearings as an extra for the front wheel.

283 C. Q. 58. Have you just completed this nine or ten days' talk in behalf of the complainant corporation in the regular course of your annual employment as attorney for that corporation?

A. I have been testifying for several days as a witness in this case, as the record shows, and at the request of Mr. Coburn, and have just been given to understand that my direct examination was ended.

C. Q. 59. Have you given this deposition under any other terms of employment or pay except your annual salary as attorney?

A. No, sir.

C. Q. 60. You attended at Chicago, did you not, during the two or three weeks while defendants were taking their testimony?

A. I was there the greater part of the time.

C. Q. 61. You suggested and kept notes and was continually consulted in the examination of defendant's witnesses, were you not?

A. Frequently.

C. Q. 62. In your examination you have to a large extent suggested and dictated the subject-matter concerning which you were to be interrogated, have you not?

A. No, sir.

C. Q. 63. You are quite sure of this, are you?

A. Quite sure of what?

C. Q. 64. Has your deposition been taken in your office, being one of the rooms of complainant corporation?

A. Yes, sir.

284 C. Q. 65. Could you explain to the court why you, as the annual salaried counsel of complainant, appear upon the stand as a witness to help swear through the complainant's case?

A. I think I could, if required. I was requested by Mr. Coburn to testify as to certain matters within my knowledge and recollection relating to the case, because they were within my knowledge, and also to testify as to my understanding and opinions and reasons for my opinions in some things relating to the mechanics of the case, because he thought I was qualified with a knowledge and understanding of them, and I have endeavored to do as requested.

C. Q. 66. Have you any interest in the result of this case?

A. Not of any account. I hold one share of stock in the complainant corporation, the whole capital stock consisting of one thousand shares, I believe.

C. Q. 67. Have you ever testified in any case in behalf of your client, the complainant, before in any litigation on their patent?

A. Yes; sometimes.

C. Q. 68. It is understood that you are to be always "requested" to testify in behalf of your client?

A. No, sir; there is no such understanding.

C. Q. 69. In this case were you "requested" by Mr. Coburn in writing to testify?

A. I think not. I don't recollect.

C. Q. 70. Do you know whether your annual employment with the complainant will cease or not in case the assertions made by you in your deposition are not believed by the court?

A. Of course I don't know when they may cease, but I have no reason to believe that my testimony in this case will have anything to do with it.

285 C. Q. 71. Have you ever investigated so as to know the value which the highest court of the State, where this case is to be tried, places on the testimony of a lawyer who voluntarily goes on the stand to swear through the case of his client?

A. No, sir.

C. Q. 72. At the time of your former examination there was offered in evidence a paper which professed to be an absolute assignment of the Kirkpatrick and Shire patents in suit to the complainant by Kirkpatrick, the patentee. Is that the only writing relating to either the Kirkpatrick or Shire patents which exists between the complainant and Kirkpatrick?

A. No; I think not, but that paper was what it professed to be—an absolute assignment.

C. Q. 73. Perhaps; but so that the court may understand whether that assignment is what you say it is or a subterfuge will you produce and make part of this record any and all contracts or agreements relating to either the Kirkpatrick or Shire patents in suit between the complainant and Kirkpatrick or any person representing him?

A. The assignment shows for itself what it is, and is of record. There was no other contract made at the time that was made or since, so far as my knowledge extends, modifying, qualifying, or affecting that assignment in any way. As I stated before, if I remember correctly, part of the consideration for that assignment consisted in a promise to pay certain sums in the nature of royalties from time to

time afterwards, but I have not in my possession or control any papers referring to the Kirkpatrick patent, unless it be some private correspondence.

Adjourned at 5 p. m. until 10 a. m., Thursday, October 6, 1887.

286 Resumed Thursday, October 6th, at 10.30 a. m.

C. Q. 74. You drew all papers relating to the Kirkpatrick and Shire patents in suit between Kirkpatrick and the Pope Company, did you not?

A. Yes; I think so.

C. Q. 75. Was the contract relating to the Kirkpatrick and Shire patents in suit, other than the assignment referred to, offered in evidence in writing?

A. There was no other contract relating to the assignment, as I recollect it, but there was, I think, an agreement as to the time and amount of payment of the consideration, which was in writing.

C. Q. 76. Will you produce that agreement?

A. I haven't it in my possession.

C. Q. 77. Will you go out in the other room and get it?

A. No; I don't think so. I presume there is a copy or a duplicate in the possession of the complainant, but I have no other control over it than to go and ask them for it.

C. Q. 78. Will you go and ask for it of the complainant and then come back and answer the question?

A. No, sir.

Defendant's counsel gives notice to the complainant to produce, under the testimony of this witness, or to deliver to the officer, to be made part of this record, all contracts existing between the complainant and Kirkpatrick, the patentee of the Kirkpatrick patent in suit, relating to the Kirkpatrick and Shire patents in suit or to any interest or title which said Kirkpatrick may have in said patents, and, in default thereof, will move to dismiss said patent from the bill of complaint filed herein.

287 C. Q. 79. In this contract, which you won't produce, between the complainant and Kirkpatrick relating to the Kirkpatrick and Shire patents in suit, what interest did Kirkpatrick retain in said patents?

A. None at all. I have already testified that, to the best of my knowledge, there was no reservation or qualification as to the title or the assignment which has been referred to.

C. Q. 80. I notice the peculiar language you have used; but by this contract which you don't show, relating to the Kirkpatrick and Shire patents, who was to conduct the litigation on those patents? And please understand that when I use the word "contract" I mean the contract you don't show, between Kirkpatrick and the complainant, and by the Kirkpatrick and Shire patents I mean the two patents in suit.

A. I have not intended to use any peculiar language. So far as I know or recollect, there was nothing to relieve the complainant

from the conduct of the litigation on those patents which might result from its ownership of them.

C. Q. 81. Was there anything in this contract that you won't show which obligated the complainant to conduct the litigating of the Kirkpatrick and Shire patents?

A. I think the company agreed with Kirkpatrick, in connection with the payment of that part of the consideration which was left to be paid as in the nature of royalties or per saddle made and sold by them or their licensees, that they would use reasonable effort to prevent or recover for saddles made in infringement and account for those also, but exactly what the agreement was or is in these respects I cannot now say.

288 C. Q. 82. Did the complainant agree to pay over to Kirkpatrick any back damages collected by litigation or otherwise for an infringement of these Kirkpatrick and Shire patents in this contract you won't show?

A. I don't remember as to that, but my impression is that it did not.

C. Q. 83. Did this contract which you won't show provide for the return of the paper title of the Kirkpatrick and Shire patents under any circumstances to Kirkpatrick? And what makes you wait so long before answering the simple question?

A. Your intimation that I was waiting so long is entirely uncalled for. My hesitation was simply an effort to recall to my mind whether there was any agreement that the company would sell the patent back or assign it back in case it failed to keep its promises as to the consideration. My impression is that it did not. I think it was understood that the company was responsible to pay any sums it agreed to pay without any further security. I cannot answer your question any more positively than that, except to say, as I have before, that the assignment was understood to be absolute, and that there was no reservation of title nor reservation of title to Mr. Kirkpatrick, to the best of my recollection.

C. Q. 84. Will you step out in the other room and look at this secret contract and see?

A. No; I don't think it my duty to as I at present understand it. I may state here that my objection to seeking to obtain from the company and produce here any papers relating to their business with other parties, as called for in this and previous questions, is simply this, that I do not think it right and proper for me to use my relation of attorney with them to obtain and spread before

289 a rival concern and Mr. Gormully, who is present, details of their business with other parties which have nothing to do with this case and concerning which I have not testified in my direct examination.

C. Q. 85. You have acknowledged yourself in your true character in this last answer, and I will ask you if you can recollect that you took an oath in this case to tell the whole truth and whether this has any effect on your testimony, irrespective of your assertion in your last answer as to the obligations you feel to the complainant as their attorney?

A. I have not only acknowledged myself, but testified fully as to my true character. I do recollect fully my oath as a witness in this case and believe I understand it and have been and am keeping it.

C. Q. 86. Does the complainant pay royalty to Kirkpatrick under the Kirkpatrick and Shire patents upon the principal part of the saddles manufactured and sold by them?

A. I think it does pay some sum per saddle in the nature of royalties, as part of the consideration for the assignment, as I before stated.

C. Q. 87. Does the complainant report quarterly or annually these royalties to Kirkpatrick and pay them or at any other stated period fixed by the secret contract?

A. I think it does; annually.

C. Q. 88. Who pays the entire cost of the litigation of these Kirkpatrick and Shire patents, and does any of it come out of Kirkpatrick?

A. No; the complainant pays it.

C. Q. 89. Was that so provided in the agreement you don't show?

A. I don't remember that there was any agreement to that effect.

290 C. Q. 90. By this contract which you don't show can the complainant sell or part with the title of this Kirkpatrick and the Shire patents without the consent of Kirkpatrick?

A. I don't know of any agreement in that respect. I know no reason why they cannot sell the patents if they wish to.

C. Q. 91. By the terms of this secret contract would Kirkpatrick have any interest in the proceeds of the sale of these patents?

A. No, sir; not so far as I know or recollect.

C. Q. 92. By the terms of this secret contract can the complainant license any party or parties under these Kirkpatrick and Shire patents?

A. There is no prohibition or restriction on their licensing other parties, so far as I know.

C. Q. 93. By the terms of this secret contract would Kirkpatrick have any interest in the royalties collected under any license granted by the complainant under these Kirkpatrick and Shire patents?

A. I think he would be entitled to have any licensed saddles added to the number made and sold by the complainant, and that the annual payments he is to receive depend in amount upon that number, so that in this way he would have an interest.

C. Q. 94. Can you release any royalties or exchange licenses of Kirkpatrick and Shire patents with any other parties owning saddle patents without accounting therefor to Kirkpatrick under this secret contract?

A. As I understand it, the complainant is under obligation, as I have before explained, I think, to account to Kirkpatrick for the number of saddles made by it or by its license or permission

291 under those patents, but I don't understand that there is any

limitation on their full right to make any transactions in respect to the patents.

C. Q. 95. Was this obligation in writing and made at the same time as the assignment?

A. I think there was something of that kind in writing, and made about that time.

C. Q. 96. You know so, don't you; and you drew all the papers, didn't you?

A. I drew some papers, and I have answered to my knowledge as well as I can.

C. Q. 97. You drew all the papers, didn't you; and you signed this contract you don't produce, as attorney for the Pope Company, did you not?

A. I don't recollect distinctly as to that. I drew or dictated some papers. I don't think I signed any, unless it were as witness, but I may be in error as to that. I cannot say that I have drawn or dictated all papers between the complainant and Kirkpatrick.

C. Q. 98. Where was this secret contract made?

A. I don't remember distinctly, but my impression is that it was made in Boston.

C. Q. 99. Did Kirkpatrick execute it here?

A. I don't remember distinctly whether he did or not.

C. Q. 100. By the terms of that contract does the complainant cease paying royalty if the Kirkpatrick or Shire patents are declared invalid?

A. I don't remember as to that.

C. Q. 101. You know very well, do you not, that the reason why you don't show this secret contract is because it is a fraud and a subterfuge and does not represent such contract relations between the complainant and Kirkpatrick as could permit the bringing or sustaining of this suit on the Kirkpatrick and Shire patents?

292 A. No, sir; to the best of my knowledge the contrary of the question is true in every particular, and I have explained my reason for not producing it, that it is not in my personal possession or control, and that I do not consider it part of my duty as a witness to endeavor to obtain or produce it.

C. Q. 102. Will you, as the annual attorney of the complainant, produce and deliver to the court at the trial this secret contract, so that the court may determine whether a fraud is being practiced upon it by the litigation of these Kirkpatrick and Shire patents under the paper assignment offered in evidence?

A. I don't know whether I will produce it or not; but both you and the court may understand that I resent and repudiate your suggestions of fraud and imposition.

C. Q. 103. We will go now to the Peters patent in suit, and I ask you to state again who first purchased the Peters patent, to your knowledge, and for whom was it so purchased?

A. I have already answered in this case that Mr. Drew sold it to the complainant, and, as I understand it, had purchased it of the patentees, and that I was not satisfied with the assignment which

Mr. Drew had from the patentees, and drew another one for them to sign.

C. Q. 104. Were you ever the attorney for Mr. Drew?

A. I may have been in respect to that transaction.

C. Q. 105. Whatever money Mr. Drew paid for the Peters patent was obtained from the complainant, was it not, and you knew it?

A. I don't know whether it was or not.

C. Q. 106. You do know, don't you, that you yourself per-
293 sonally instigated and directed the purchase of this Peters patent for the complainant, personally attended to the entire purchase, and that you personally simply used Drew as a blind to purchase the patent, and that you furnished for the complainant every dollar of money that went for the purchase of that patent?

A. No; that isn't correct. I did advise the company to purchase the patent, but I didn't attend personally to the purchase of it or provide any money for it or have anything else to do with it that I now recollect except to draw a new assignment for Drew and perhaps send it to Mr. Peters and draw the assignment from Mr. Drew to the Pope Manufacturing Company.

C. Q. 107. Do you know the handwriting of Mr. Peters?

A. No.

C. Q. 108. So that the court may make up its mind whether or not to have that perfect and entire confidence in you as a witness that a young child has in its mother, I will ask you to look at a letter professed to be written or signed by you, directed to Orrin E. Peters, dated October 14, 1882, and ask you if you signed and sent that letter, as appears by its contents.

A. Yes, sir; I signed the letter, and I have no doubt it was sent by my direction.

Defendant's counsel here offers in evidence the letter just referred to and requests that it may be marked "Defendant's Exhibit Pratt-Peters 1882 Letter."

C. Q. 109. Did this Mr. Drew ever give you a dollar in money to purchase this Peters patent?

A. No, I don't recollect that he did; but now that you have shown me this letter, which I had entirely forgotten, I cannot say positively.

294 C. Q. 110. Did this Mr. Drew ever pay you a dollar of money as his attorney, or did you ever send him any bill?

A. I don't remember that he did. I don't think I ever sent him any bill.

C. Q. 111. Are you yet ready to admit that you purchased this Peters patent solely for the complainant, and simply used Drew as a tool for its purchase?

A. I am ready to admit all I can remember about the transactions connected with that purchase, and I admit that the letter just produced is a complete surprise to me, and that I may have been aware of or communicated to Mr. Drew some requests of the complainant or of Col. Pope, its president, in regard to the purchasing of it; but the only things which I remember about it are what I

have already stated—that I advised the company or Col. Pope to purchase the patent, and that I drew the two papers I have referred to. I have no doubt that the patent was purchased as a result of that advice, and that whatever was paid to the Peters brothers for the patent was paid or repaid by the complainant, and probably more with it; but I still think that I never saw the Peters brothers, nor purchased the patent myself, nor "used" Mr. Drew.

C. Q. 112. As I understand you, all negotiations leading up to the execution of contract No. 3 in this case were in writing between the complainant and Mr. Gormully, were they?

A. I think the most of them were, but I think also that I had a personal interview with Mr. Gormully in regard to the matter before or at the time it was signed.

C. Q. 113. Did the complainant in this case ever state or in-
295 timate in any manner to Mr. Jeffery that they considered him a party to or bound by in any way any of the license agreements between the complainant and the defendant Gormully; and can you produce a letter or a notification of any kind to this effect?

A. I don't know or recollect as they have.

Adjourned until 2 p. m.

Resumed at 2.30 p. m.

C. Q. 114. Did you write the original letter of March 10, 1883, from which you have quoted and a copy of which is offered in evidence?

A. Yes, sir.

C. Q. 115. Did you mail it?

A. I don't recollect, and can only say in respect to that that I think it was mailed in the usual course of my business, which was to hand my letters to a mail boy subject to my call to take to the post office.

C. Q. 116. And you have no personal knowledge whether this alleged letter to Mr. Gormully of March 10, 1883, was ever mailed or not, have you?

A. None, except such knowledge as arose from his reply, so far as I recollect.

C. Q. 117. In what manner did any reply of Mr. Gormully identify this particular letter of March 10, 1883?

A. His letter of March 12, 1883, begins with "yours of the 10th inst. just at hand, and in reply would say."

C. Q. 118. To whom was that letter from which you have just quoted addressed?

A. "The Pope Manufacturing Company, Boston, Mass."

C. Q. 119. Do you know whether the Pope Company wrote Mr. Gormully any other letter on March 10, 1883, than the one you have asserted in your testimony?

296 A. No, sir.

C. Q. 120. What do you understand to be the meaning of the term *in statu quo?*

A. Taken alone I understand it to mean in the status or position in which.

C. Q. 121. That was what you meant, wasn't it, in the letter to Mr. Gormully of May 4, 1884, in evidence?

A. Yes, sir; unless the context qualifies the meaning.

C. Q. 122. Do you mean to state that Mr. Gormully in any of his extended correspondence with you, carried on for the purpose of settling the terms of these several licenses, ever admitted or agreed to admit that any of the letters patent of the complainant were good and valid letters patent or that any bicycle structure manufactured by him infringed said letters patent?

A. Yes, sir.

C. Q. 123. Have you offered in evidence all proof of this kind which you have?

A. All that I think of at present.

C. Q. 124. You know, do you not, that Mr. Gormully has always asserted, both in conference and by correspondence, that after April 1, 1886, you would have no good and valid letters patent which he cared to use in any bicycle or tricycle structure or which he would infringe?

A. No, sir; not exactly that. He said he thought at the time and before contract No. 3 was concluded that he shouldn't want to use any other of the patents referred to than those which expired on or about April 1, 1886.

C. Q. 125. Under your assertions that Mr. Gormully has admitted the validity of the patents sued upon, do you assert or claim that he has admitted their validity to any other purpose and extent than the exact and specific mechanism shown in each respective patent?

297 A. Yes, sir; I understand that he admitted just as was expressed and stipulated in the contracts. I don't undertake to say what Mr. Gormully believed in the abstract or what mental reservations he had, but, as I understand it and recollect it, he assented in full to those contracts.

C. Q. 126. And all the knowledge you have about Mr. Gormully's understanding and admissions as to the validity and scope of complainant's patents is obtained from the several contracts, is it?

A. No; I don't mean to say that. I mean to say just what I did say—that after all the discussions and negotiations which took place Mr. Gormully gave his full consent to those contracts as signed, and I think they express what he concluded to admit.

C. Q. 127. Do you claim that Mr. Gormully has ever admitted the validity of either Shire, Veeder, or Kirkpatrick patents sued upon, or that any mechanism manufactured by him infringed said patents?

A. I don't now remember any such admission in regard to the Shire and Kirkpatrick patents. The Veeder patent was expressly referred to in the contract No. 3 and included amongst those of which he admitted the validity and agreed not to use without license.

C. Q. 128. Point out to the court what clause in contract No. 3 by

reason of which you claim that Mr. Gormully admitted that he used any device of the Veeder patent in suit in his bicycle structures.

A. I haven't intended to state that he admitted in that contract that he used the Veeder device in his bicycle structures, but that he agreed not to use it without license, and admitted the validity of the patent.

298 C. Q. 129. If he doesn't infringe any of the claims of the Veeder patent is he using the patent without license?

A. I don't understand the meaning of your question, perhaps. He agreed that he wouldn't make or sell, directly or indirectly, "saddles having a flexible seat and means of taking up the slack" without license.

C. Q. 130. Such admission was based on the assertion in the opening clause of section ninth, that this invention was contained in some of the above-recited letters patent, was it not?

A. It was contained in section ninth, along with the rest of the section.

C. Q. 131. Can it be possible that you claim that under the ninth clause of contract No. 3 Mr. Gormully could — and can never make bicycle or tricycle mechanisms having saddles adjustable fore and aft and saddles having a flexible seat and means of taking up the slack if none of the patents recited in contract No. 3 contain any claims which would cover the saddle mechanism constructed by Mr. Gormully?

A. No, sir.

C. Q. 132. Then the saddles referred to under clauses *j* and *k* of contract No. 3 must be such saddles as infringe some claim of some patent owned by the complainant and mentioned in the contract, must they?

A. Answering the question in a general way, yes; because saddles having those features were understood so to infringe; but answering in a more specific way, no, not necessarily, if you mean such saddles as might by some close or rigid construction be held by somebody not to infringe, because those clauses were added to the expression of an agreement not to infringe in order to make it more specific, and as to some things save the question of

299 infringement or construction arising to differ about, and the agreement not to make saddles having a flexible seat and means for taking up the slack stands, therefore, as I understand it, as a distinct promise by itself.

C. Q. 133. And the terms and conditions of the sixth, seventh, eighth, ninth, and eleventh clauses of contract No. 3 are in force against Mr. Gormully as long as he lives, in your opinion, are they not?

A. No, sir.

C. Q. 134. Well, how long does the Pope Company now claim such clauses are in force against Mr. Gormully?

A. As I understand it, those clauses are in force until the end of the terms of the letters patent recited in the licensing clause of that agreement.

C. Q. 135. Have you had a vision or revelation to this effect since the argument of the injunction motion in this case?

A. I don't understand any reasonable drift of your question. I wasn't present at the argument referred to.

C. Q. 136. Will you kindly point out to the court what clause or line or sentence there is in contract No. 3 by which you now state that the clauses last referred to only bind Mr. Gormully during the lifetime of the longest patent identified by the special clause of the license?

A. I didn't state it and don't state it exactly that way. The previous question, as I understood it, asked me to name some time during which those clauses would be in force. The term of the license clause was, of course, to the end of the term of the patents under which license was granted, and, as I understand it, these clauses are in force at least as long as that, and perhaps, so far as they relate to specific patents or devices extending beyond that time, for a longer time.

300 C. Q. 137. Your last answer appears to be about as clear as mud. Now, as you have professed on the record to be the author principally of this cut-throat affair marked contract No. 3, I insist upon your pointing out and quoting from that contract such clauses or portions that will intimate in any way that the defendant Gormully is not bound for his natural life by all the terms and conditions of the sixth, seventh, eighth, ninth, and eleventh clauses of this contract?

A. I do not find any clause or portion of said agreement which states in so many words when Mr. Gormully would cease to be bound by the clauses referred to, but the whole agreement relates to letters patent and the use of inventions recited in them, and the eleventh clause, which exempts these clauses from expiring with the expiration, revocation, or surrender of the license part of the agreement, indicates that these clauses are to be in force, so far as they have not been fulfilled, to the end of the term or terms of the patents referred to in the agreement. I understood and I think it was understood by the parties, as I have already testified, that those clauses in the agreement were to continue as long as the patents did.

C. Q. 138. Perhaps; but you find it stated that "the obligations, admissions, and agreements contained in the sections hereof numbered sixth, seventh, eighth, ninth, and eleventh * * * are irrevocable except by the written consent of the party of the first part," do you not?

A. Yes, sir; I believe that is right.

C. Q. 139. Now, you drew this alleged contract, and if this contract No. 3 did not expire on April 1, 1886, as to all the "obliga-

301 tions, admissions, and agreements" of the five clauses just identified is there any limitation as to the expiration of those clauses as to time, and are not such clauses wholly irrevocable except by the written consent of the corporation complainant?

A. I have already answered the substance of the question as well as I can.

C. Q. 140. Then you admit, as I understand you, that the "obli-

gations, admissions, and agreements" of the five clauses of agreement No. 3 referred to are irrevocable except by the consent of the corporation complainant?

A. I understand that it is so expressed in the contract.

C. Q. 141. Contract No. 2, which you drew, specifically fixes a date at which the contract must expire, does it not?

A. It says, at the end of clause tenth, "unless sooner terminated as provided in this section, this agreement shall remain in full force until the full end of the terms for which said letters patent mentioned in section first were granted."

C. Q. 142. Referring again for a moment to the patent in suit, at the time you purchased that patent did you obtain from the Peters an assignment of back damages arising out of any infringement of their patent or obtain from them a release of back damages by reason of an infringement of the complainant?

A. The assignments will show, I think, whether that was the fact or not.

C. Q. 143. At the date you purchased the Peters patent, for how long a time then had the complainant been using a ball-bearing device in its manufacture, such as you now say infringed the second claim of the Peters patent?

A. For some time; perhaps a year or two or more.

302 C. Q. 144. Had the complainant used such ball-bearings in large quantities during that time?

A. They had made and sold machines with the Wallace bearing for some time and to a considerable number. I cannot state how many.

C. Q. 145. Who made out the bills filed against the defendant in the several suits and where were they made out?

A. I think Coburn & Thacher made them out, drew them, and sent them here for execution.

C. Q. 146. Some of the bills filed, as to the written portions, were made out by you, were they not, and sent out to Messrs. Coburn & Thacher to be filed?

A. I'm not certain about that. My impression is that I did make out one draft of a bill here and sent it to Coburn & Thacher for revision or such use as they might make of it, but I cannot now tell very definitely about it.

Adjourned at 5 p. m. until 10 a. m., Friday, October 7, 1887.

Resumed Friday, October 7, 10 a. m.

C. Q. 147. Which patent in this contract No. 3 do you suggest may limit the duration of the contract?

A. Well, the patent No. 308,394, dated December 2, 1884, is the last one to expire in term, I believe.

C. Q. 148. You are the inventor in that patent, ain't you?

A. Yes, sir.

C. Q. 149. State the exact consideration which appears in contract No. 3 under which you contend the defendant Gormully is

estopped hereafter from engaging in the bicycle and tricycle industry.

303 A. As I don't contend that the defendant Gormully is estopped as stated in the question, I cannot answer the question directly. The considerations specifically named in the contract are one dollar, the mutual covenants, etc., as mentioned on the first page of the agreement, and the "obligations, admissions, and agreements contained in the sections hereof numbered sixth, seventh, eighth, ninth, and eleventh hereof, which are a part of the consideration for the granting of the license herein."

C. Q. 150. In your opinion, then, the expiration of all the patents mentioned in the first clause of contract No. 3 would have no effect on the expiration of the lifetime of the contract, would it?

A. Yes; it would have an effect upon the application of it and on the expiration of parts of it, as I understand it, for I understand the contract to relate principally to letters patent and devices covered by them, and that the expiration of the patents affects the expiration of the lifetime of the contract.

C. Q. 151. In what respect would contract No. 3 be in force as against the defendant Gormully between the date of the longest lived patent mentioned in the first clause and the date of the expiration of your 1884 patent, before specified? What clauses of contract No. 3 would be in force during that time as against the defendant Gormully?

A. As I understand it, the clauses mentioned in section eleventh as "the sections hereof numbered sixth, seventh, eighth, ninth, and eleventh" would be in force during all that time so far as they are applicable to or to be construed in connection with the 1884 patents referred to and in respect to the other patents and devices also during so much of that time as should be covered by the terms of the patent respectively.

304 Q. 152. What do you mean in your answer that the five sections of contract No. 3 mentioned "would be in force during all that time so far as they are applicable to or to be construed in connection with the 1884 patent referred to"?

A. I mean that. I don't know as I can express it any better.

C. Q. 153. Clause seventh provides that the defendant Gormully shall stamp the word "patented," together with the date of the patents, on each machine made or sold under this license, and the defendant Gormully is only licensed to make machines under the patents specified in the first clause of the contract. It is your construction of that contract, is it not, that clause seventh is in force after the expiration of every patent in clause first, and the defendant Gormully must stamp his machines as patented under such patents after every patent in clause first has expired and until your 1884 patent expires, must he not?

A. No, sir. He would only be required under that clause, as I understand it, to so stamp machines made or sold before the expirations of the patents covering the inventions which they contain. As I understand it, if he made machines under the patents under which he was licensed and sold them after the expiration of the patents he

would be required to stamp them as agreed as well as to account for them.

Defendant's counsel, under the objection heretofore made and under the objection founded upon the relation of this witness to the corporation complainant and his record as made herein, declines to cross-examine such witness as to any assertion of fact or opin-
305 ion given by this witness relating to any letters patent offered in evidence by the complainant and professing to be the property of such complainant or as to any letters patent offered in evidence by the defendant.

Counsel for complainant appreciates the apparent feeling of inability of counsel for defendant to in any way impair the force and strength of the opinions and reasons therefor given by the witness in rebuttal to the testimony of one of the parties defendant who is an interested party to the extent of being a half owner, and waives redirect examination.

CHARLES F. PRATT.

PAUL A. STALEY, the next witness called to testify on behalf of the complainant in rebuttal, first being duly sworn, testified, in answer to interrogatories asked him by the respective counsel, as follows:

Q. 1. What is your name, age, residence, and occupation?

A. Paul A. Staley; age, twenty-eight; residence, Springfield, Ohio; occupation, mechanical expert and solicitor of patents.

Q. 2. What has been your experience in mechanical matters and letters patent, and more especially with reference to inventions pertaining to velocipedes and bicycles and their saddles, which would tend to qualify you to testify as an expert in suits involving velocipede and bicycle saddle inventions?

A. I have been engaged in mechanical pursuits ever since I was old enough to engage in any form of occupation. At an early
306 age I studied mechanical drawing and was engaged practically in the capacity of mechanical draughtsman with one or two large manufacturing concerns. While engaged in this work I began making drawings for patents, and for the past eight years have been actively engaged in preparing and prosecuting applications for letters patent and the work incident thereto. During this time I have taken out some patents relating to velocipedes and saddles therefor, and have on several occasions been called upon to make extensive examinations of records and devices and give opinions in this particular line of mechanical devices and the patents therefor.

Q. 3. Please look at the patents, Complainant's Exhibit Shire Patent; also the following patents, viz., Defendant's Exhibit Harris 1875 Saddle Patent; Defendant's Exhibit Schmidt 1871 Saddle Patent; also Defendant's Exhibit Lamplugh & Brown 1878 Saddle Patent; also Defendant's Exhibit Curry 1867 Saddle Patent, and state whether you are familiar with said patents; and, if you are, please compare the mechanisms found in each of the said defend-

ant's exhibits with the mechanisms shown and described in the said Complainant's Exhibit Shire Patent, and especially made the subject-matter of the second claim thereof, and explain to the court their similarities and differences, giving such reasons as you may desire for any opinions you may express.

A. I have examined each of the patents referred to, and I believe that I understand the construction and operation of the devices therein set forth and claimed. I find the invention in the Shire patents, or especially that portion of it set forth in claim two, to consist, as stated in the specification, "in the construction and adaptation of the seat so that it is brought into close proximity to the driving wheel, thus allowing a wheel of greater diameter
307 to be used than when constructed in the ordinary manner."

I find further in the specification the following language used in description of this portion of this invention: "Secured to the top of the frame D and extending rearward over the wheel A′ is a fender, the rear end of which rests upon as secured to a forked frame or standard, G, which rises from the rear end of the frame D. To the top of this fender F is rigidly secured a seat block, H, to which is secured one end of the adjustable hammock seat J, the opposite end of which is provided with a strap and buckle, *h*, to engage with loop *i* projecting from the rear face of the spring.

"By this construction it will readily be seen that the elasticity is entirely derived from the metallic spring E, and the torsional strain upon the rear frame incident to the ordinary manner of construction is entirely avoided, while at the same time a much more elastic and even support for a seat for the operator is obtained.

"It will further be seen that by the use of an adjustable hammock seat, as described, the seat may be brought into closer proximity with the driving wheel than when constructed in the ordinary manner, which will admit the use of a driving wheel of greater diameter."

From this statement and description I am led to believe that the portion of the invention of Shire consisted in making a seat or saddle of flexible material and supported from each end after the manner of a hammock and provided with means for adjusting the same. The second claim I find to be as follows: "In a velocipede, the adjustable hammock seat J, substantially — set forth."

In the Shire saddle I find no saddle frame or tree, the ends of the seat being suspended at either end from parts of the velocipede, as before stated, after the manner of a hammock.

308 In the Harris patent referred to I find described and shown a riding saddle or horse saddle, the covering of which is secured to the rear portion of the frame or tree, commonly called the cantle, and the front portion being secured to the front portion of the frame or tree, commonly called the pommel, the pommel in this case being made in the form of a spring and the saddle cover being connected at the front end to the spring by a metal bar, marked *m* in the drawings, which fits into a hook, *c* 1, formed in said spring. This construction differs materially from the construction shown in the Shire patent in the fact that it has a distinct frame or tree and

in the fact that there are no means described or shown for adjusting the seat covering. That the frame is an essential part of this construction it would seem to me follows from that portion of the description found in the specification in the following language: "From this construction it is evident that to convert my spring saddle into one having an ordinary seat it is only necessary to lift the bar *m* from the hook *c* 1, and the pieces *a a* rest snugly on the tree, and the seat is deprived of any spring." From this description and from the construction shown in the drawings I am led to believe that the Harris saddle was designed for an entirely different purpose, and could not accomplish the objects and functions of the Shire saddle as described in the patent and set forth in claim two.

The Schmidt patent I find also relates to riding saddles and, as the specifications states, "to saddles of that class which embody springs in their construction, in order that they may readily accommodate themselves to the varying shapes of the bodies of different horses and, at the same time, form a yielding rest for a rider.
309 My improvement consists in combining with the saddle-tree and the saddle blanket also the bolsters or cushions composed of springs and interposed between the bars and the tree and the blanket so as to form yielding surfaces of contact with the horses' sides, which sustain the superincumbent weight of the rider and make the saddle easy to the horse by reason of its yielding to the movements of the muscles of the latter while traveling."

I find that this patent, as the Harris patent, also shows a supporting frame or tree. The pommel and cantle of the frame or tree are formed arches or bows, which are riveted or otherwise secured to the side portions of the tree. The leather seat I find, as stated in the specification, "is suspended between the cantle and pommel, to which its respective ends are buttoned or otherwise attached, after which it is covered with the ordinary cover F′, which is also fastened to the cantle and pommel."

I do not find in any portion of the drawing of the specifications anything which indicates that the seat is to be adjustable, and it aims to have been designed for an entirely different purpose and could not by any possible means accomplish the objects or functions of Shire saddle as set forth in claim two of this patent.

The Lamplugh & Brown patent referred to I find relates to improvements in bicycle saddles. In making the saddle the inventors state in their specification: "We adopt the ordinary seat formed with a cantle at one end and at the extreme the pommel. We then employ a metallic plate in form somewhat approaching the said seat. The surface of the metallic plate is concaved, so that the form corresponding to the pommel and cantle are in elevation, and to these we suspend the said seat, having secured
310 the same by riveting or otherwise. The sides of the metallic plate we arrange in the form most suitable for our requirement."

From this statement and from the further description drawn from the specification and from the drawings forming a part of the specification I learn that this saddle has a distinct frame or tree, this frame or tree being formed from a metallic plate referred to in the

drawings by the letter B. The inventors say that the covering or seat portion of the saddle is riveted or otherwise secured to the said plate. I find no indication in the specifications or anything in the drawings which would lead me to believe that there was any adjustment of the seat as contemplated by Shire, and the only similarity in the construction and operation of the saddle shown in this patent and the one shown and described in the Shire patent lies in the fact that they are both adapted to the same general purpose, namely, for use on a bicycle.

The patent of Curry referred to, like the Schmidt and Harris, already examined, relates to a riding or horse saddle. It also has a rigid frame or tree with the pommel and cantle, which the inventor says "are made of solid wooden pieces supported upon metal plates, which are riveted to the side bars, which maintain them in their required relative position." I find no accurate description of how the covering or seat portion is secured. The following from the specification seems to be the only thing relating thereto: "V V are holes in the cantle through which the webbing is passed. The latter is secured in any sufficient panel to the pommel and cantle respectively after having the stretch taken out of it to adapt it to bear the seat Z." I am unable to find the letters "V V" on the drawing. I do not find anything in the specification which leads me to believe that the seat was adjustable, and its distinctive features seem to be entirely different in construction from the Shire device, and it does not seem to be adapted for the same purpose or to perform the same functions.

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Q. 4. Please look at patents now shown you, marked "Defendant's Exhibit Solomon 1879 Saddle Patents;" also "Defendant's Exhibit Fowler 1880 Saddle Patent;" also "Defendant's Exhibit Shire 1879 Saddle Patent;" also "Defendant's Exhibit Miller 1866 Saddle Patent;" also "Defendant's Exhibit Nelson 1860 Saddle Patent," and compare the devices shown and described in each of said defendant's exhibits with the devices shown and described in the Complainant's Exhibit Veeder Patent and made the subject-matter of the first claim thereof, pointing out their similarities and differences, and explain to the court whether you find in either of said defendant's exhibits the mechanisms of the said first claim of the Veeder patent, giving your reasons with such opinions as you may wish.

Adjourned until 10 a. m., September 30.

A. I find, on reference to the Salamon patent, an ordinary bicycle saddle of a well-known pattern attached to a saddle bar, which is connected at either end to suitable supports through the medium of rubber cushions. This saddle differs materially from the Veeder patents in the fact that the saddle cover or seat is attached directly at each end to a solid frame, and that no means are shown or described for adjusting the tension or taking up the slack of the same.

The patent of Fowler referred to also shows a bicycle saddle of an ordinary construction secured to a saddle bar. There seems to be no flexible seat or covering for this saddle, and no means are shown for taking up the slack or adjusting the tension

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of the same, and in these respects differs materially from the Veeder saddle as set forth in his first claim.

The Shire patent referred to shows a flexible hammock seat, but does not show any under springs in two or more parts, which parts are extensible to adjust the tension or take up the slack of the saddle, and in this respect differs materially from the Veeder patent.

The Miller patent referred to shows a riding or horse saddle having a rigid frame or tree having columns at either end, to which springs are attached, a second rigid frame or tree being suspended from said springs to form the seat of the saddle. No means are shown for separating or extending the springs, and no means are set forth for taking up the slack or adjusting the tension of the saddle covering or seat, which is secured directly to the top frame or tree.

The saddle in the patent of Nelson referred to is also a riding or horse saddle, and differs materially from the Veeder patent in the fact that it has a metallic seat; neither has it any means for adjusting the tension or taking up the slack of said seat, which, in fact, being of metal, could not well be adjusted or changed in this respect. It has a rigid frame or tree, and has no under spring or springs extensible for the purpose of adjustment, as set forth in said Veeder patent, and in all these material respects differs from said patent.

Q. 5. Please examine the patents "Defendant's Exhibit Fowler
1880 Saddle Patent," "Defendant's Exhibit Veeder 1882 Saddle Patent," "Defendant's Exhibit Bishop 1859 Saddle Patent,"
313 "Defendant's Exhibit Miller 1866 Saddle Patent," "Defendant's Exhibit Curry 1867 Saddle Patent," "Defendant's Exhibit Duryea 1884 Saddle Patent," and compare the mechanisms shown and described in each of said defendant's exhibits with the mechanisms shown and described in the Complainant's Exhibit Kirkpatrick Patent and made the subject-matter of the first claim thereof, pointing out to the court their similarities and differences, giving your reasons for such opinions as you may desire.

A. In the Fowler patent referred to I find a saddle, marked J in the drawing, secured to a saddle bar or spring, one end of which is supported by suitable means to the perch or backbone of the vehicle, and the other end attached by a sleeve bearing to a steering post. I do not find therein a flexile seat, neither do I find a seat suspended directly from independent springs at the front and rear, and in these respects it differs materially from the Kirkpatrick saddle set forth in the patent referred to.

In the Veeder patent I find a suspension saddle having a flexile seat attached at either end to an under spring in two or more parts, which parts are extensible. I do not find independent springs secured to the perch or backbone at the front and rear of the seat, which seat is suspended directly from said springs, the saddle in the Veeder patent being secured to a plate or rest, marked "M" in the drawings, which is attached by suitable means to the perch or backbone. In these respects I find the saddle shown in the patent to Veeder differs materially from the saddle set forth in the first claim of the Kirkpatrick patent referred to.

In the patent to Bishop referred to I find drawings and descriptions of a riding or horse saddle. It differs materially from
314 the saddle shown and described in the Kirkpatrick patent and made the subject of his first claim in the fact that it has a rigid frame or tree. It has no independent front and rear springs secured to the perch or backbone of the bicycle or similar vehicle and a flexile seat suspended directly from said springs at the front and rear. In these respects it differs materially from the Kirkpatrick saddle referred to. In its construction it seems to have been designed for an entirely different purpose, and is not capable of performing the functions or accomplishing the purposes of the said Kirkpatrick saddle.

The patent to Miller referred to I find also relates to riding or horse saddles, and has a lower supporting frame or tree and an upper frame or tree, to which the saddle cover or seat is attached. There is no flexile seat suspended at the front and rear directly from the springs, and there are no independent front and rear seat-supporting springs attached directly to the perch or backbone of the bicycle or similar vehicle. It therefore differs from the Kirkpatrick saddle referred to, as these latter features are material points therein.

The patent to Curry referred to I find also relates to a riding or horse saddle. It has a distinct frame or tree, which is essential in all saddles of the class. The saddle cover or seat proper is attached at either end to the pommel and cantle respectively, which form rigid portions of the frame or tree. There are no springs to which the saddle or seat is directly suspended, and there are no independent front or rear springs attached to the perch or backbone of the bicycle or similar vehicle. It seems to have no points in common with the Kirkpatrick saddle except that the saddle covering or seat proper is flexible in its nature.

In the patent to Duryea referred to I find the bicycle sad-
315 dle having a frame or tree formed in the nature of a spring, which is constructed of a single rod or bar bent into the peculiar form necessary to produce the frame. I do not find that it has independent front and rear springs secured directly to the perch or backbone of the bicycle, which springs support a flexile seat suspended at each end therefrom. In this material respect it differs from the Kirkpatrick saddle referred to.

Cross-examination by C. K. OFFIELD, Esq., counsel for defendants:

C. Q. 1. Have you ever had any personal practical experience either in the manufacture, use, or sale of bicycles?

A. I have had practical experience in the use of bicycles and similar vehicles, having used such vehicles for pleasure and business purposes during the past eight years.

C. Q. 2. What bicycle do you ride?

A. I have used one known as the "Premier," manufactured by a firm in England.

C. Q. 3. What kind of a saddle has this bicycle?

A. It has had various saddles. At the present it has one of the earlier forms of the Kirkpatrick saddle, as manufactured under his patent referred to in my direct examination.

C. Q. 4. What do you mean by one of the earlier forms of Kirkpatrick saddle? Describe it as compared with the Complainant's Exhibit Kirkpatrick Patent.

A. I mean one of the saddles manufactured by Mr. Kirkpatrick himself soon after his invention was made, and it is substantially as represented in the patent referred to, with the exception
316 that the rear spring-supporting clamp has no housing through which the spring is adapted to slide.

C. Q. 5. What relation or connection have you with the Pope Manufacturing Company or any of its officers?

A. None whatever.

C. Q. 6. What relation have you to Kirkpatrick, of the Kirkpatrick patent in this suit?

A. I do not know that I hold any relation to Mr. Kirkpatrick in the present suit. I have acted as attorney for him in the prosecution of application for letters patent and in negotiations for the purchase and sale of letters patent and rights under the same.

C. Q. 7. Has Mr. Kirkpatrick now any interest or claim in any manner in his patent in suit?

A. I am not familiar with the exact terms of the contract with the Pope Company, but understand that they control all his patents and have an exclusive right in and to the same.

C. Q. 8. Did the complainant corporation purchase this Kirkpatrick patent?

A. I think not. Only the exclusive right therein.

C. Q. 9. What interest does Mr. Kirkpatrick still have in his patent in suit?

A. These are matters with which I am not familiar and which I suppose could be ascertained by reference to the contracts between Mr. Kirkpatrick and the Pope Company.

C. Q. 10. Were you Mr. Kirkpatrick's attorney at the time of this contract?

A. I acted for Mr. Kirkpatrick prior to the time that the license or contract was made, but not at the time the terms of the license or contract were agreed upon. I did not know when the
317 contract was made and had nothing to do with making the contract or determining the terms and conditions thereof.

C. Q. 11. Did you ever testify in court in a patent case before, in any case relating to bicycles?

A. I did not.

C. Q. 12. In how many cases relating to patents have you ever before testified as an expert where your testimony was received in court?

A. I believe in only one besides the present.

C. Q. 13. What was the real reason that you, a patent solicitor

at Springfield, Ohio, came this distance to Boston to testify in this case?

A. The real reason was that I was asked to do so by the Pope Manufacturing Company.

C. Q. 14. Were you asked to come here by Mr. Kirkpatrick?

A. No, sir.

C. Q. 15. In what manner did the Pope Company ask you to come here?

A. I received a letter from them through their attorney, Mr. Galt, on Saturday of last week asking if I could and would come, and, if so, to come as soon as possible. I replied by telegraph and came on, leaving Springfield on Monday of this week.

C. Q. 16. You know very well, do you not, by the statements of Mr. Kirkpatrick himself, what interest he now has in his patent in this suit?

Question objected to in evidence as calling for hearsay evidence as well as secondary evidence.

A. As I before stated, I understand that Mr. Kirkpatrick only granted the exclusive right under these patents, but in all of Mr. Kirkpatrick's negotiations with the Pope Company, where a
318 contract as the direct result of said negotiations, Mr. Kirkpatrick acted for himself and without consulting me. I do not know very well from Mr. Kirkpatrick's statements what contracts he may have made or the exact interest he has in the present suit.

C. Q. 17. Did you get this understanding from the Pope Company, its attorney and officers, as well as from Mr. Kirkpatrick?

A. I believe that the first knowledge I had of a contract between the Pope Company and Mr. Kirkpatrick was obtained from Mr. Pratt, of the said Pope Company.

C. Q. 18. When did you obtain this knowledge from Mr. Pratt, as attorney for the Pope Company, and under what circumstances?

A. It was obtained at a friendly visit I had with Mr. Pratt, at a time when I happened to be in Boston for an entirely different purpose, and I believe was prior to the time that the contract was actually drawn up. I could not state the exact time. I believe it was in the fall of 1885.

C. Q. 19. Look at this paper now shown you, professing to be an assignment from Thomas J. Kirkpatrick to the complainant, dated September 7, 1885, of the Kirkpatrick patent, among others in suit, and state if that paper represents correctly the relation of Mr. Kirkpatrick towards his patent and his relations with the Pope Company, complainant.

A. This is the first time I have ever seen this document. As before stated, I did not act for Mr. Kirkpatrick or with him in the negotiations which resulted in his contract with the Pope Manufacturing Company, and I do not know whether or not this correctly represents Mr. Kirkpatrick's interest in the present suit.

319 C. Q. 20. Did you ever see the real, *bona fide* contract between Mr. Kirkpatrick and the complainant regarding his patent suit or any contract?

A. I take this to be a real, *bona fide* contract between the parties, and this is the only one I have ever seen.

C. Q. 21. What, if anything, did you have to do with the purchase of an interest with Kirkpatrick in Complainant's Exhibit Shire Patent in suit?

A. I advised Mr. Kirkpatrick to buy it and at his request went to Detroit and made the purchase.

C. Q. 22. How much did you give for whatever interest Kirkpatrick purchased in this Shire patent?

A. I believe the consideration paid was $100.

C. Q. 23. What interest does Kirkpatrick now have in this Shire patent?

A. That I am unable to say.

C. Q. 24. What significance do you give to the words "in a velocipede" appearing in the second claim of this Shire patent?

A. I understand that the word velocipede as there used signifies that the construction set forth in the second claim is especially adapted for velocipedes.

C. Q. 25. But the device claimed there is not confined to a velocipede, but could be employed in a hay wagon or either in a stationary seat, could it, or any purpose?

A. No, sir; that is not my understanding of it.

C. Q. 26. Well, is it your understanding, then, that the invention of the second claim of the Shire patent to be employed must be embodied "in a velocipede"?

A. That is the way I have always construed it.

C. Q. 27. What is the sole object of the adjustability of the hammock seat J as identified by the second claim of the Shire patent?

320 A. I understand that the object of the adjustable feature referred to was to bring the seat farther from or into closer proximity to the driving wheel by taking up or increasing the slack of said seat.

C. Q. 28. An adjustable hammock seat which was adjustable simply for the purpose of taking up the slack, without reference to bring the seat in closer proximity to the driving wheel, would not be the adjustable hammock in the second claim of the Shire patent, would it?

A. I cannot imagine one condition without the other. I think the adjustment of the slack would necessarily result in bringing the seat when in use further from or into closer proximity to the driving wheel.

C. Q. 29. The Shire patent states that the adjustable hammock seat may be brought into closer proximity to the driving wheel than when constructed in the ordinary manner. If a hammock seat was made adjustable in a velocipede so as to be taken farther away from the driving wheel by its adjustability, would such adjustable hammock seat, in your opinion, come under the second claim of the Shire patent?

A. I do not understand that the adjustable feature of the hammock saddle necessarily refers only to bringing it into closer proximity to the driving wheel. The very fact that it is adjustable

makes it possible for it to be brought either closer to or farther from the driving wheel, and I should say that a saddle of the hammock class, which is adjustable to bring it farther from the driving wheel, would come within the several claims.

C. Q. 30. What do you understand to be the "ordinary manner" referred to in the Shire patent in speaking of its closer proximity to the driving wheel?

A. I understand by that the manner of forming velocipede saddles that have been employed prior to the date of Shire's invention.

321 C. Q. 31. In what manner and for what reason does the adjustability of the hammock of the Shire patent admit the use of a driving wheel of greater diameter?

A. It does for several reasons. It dispenses with the ordinary saddle frame or tree, which it had been common to employ prior to the date of this invention. It dispensed with the use of the ordinary saddle bar or spring on which the ordinary form of saddle had been supported, and, being adjustable, it was capable of being placed near to the perch, and consequently near to the wheel.

C. Q. 32. In your opinion does the construction of saddle shown in Defendant's Exhibit "American Champion" Bicycle admit of the use of a driving wheel of greater diameter on account of any adjustability?

A. Of greater diameter than what? I am not sure that I understand the question.

C. Q. 33. I mean, of course, whether the hammock seat of the defendant's bicycle admits the use of a driving wheel of greater diameter in any manner or in any way contemplated in the second claim of the Shire patent we have been talking about.

A. I find in defendant's exhibit referred to a hammock saddle supported at the rear end by means which will permit of an adjustment to increase or diminish the slack of the said seat or saddle. This adjustment will permit of the saddle being brought closer to the perch or backbone of the machine when in use, and consequently will permit the use of a larger wheel than one which was not formed on the hammock principle or did not employ means for adjusting the same in the manner contemplated by the second claim of the Shire patent.

322 C. Q. 34. Seriously, do you want the court to understand that the slight possible regulation of the slack of the saddle in defendant's exhibit has any practical or possible relation to the size of the driving wheel in that exhibit?

A. Most seriously I do. If there is any difference in the operation of the devices in this respect it is one of degree only.

C. Q. 35. You are perfectly well aware of the fact, are you not, that in bicycle saddles, such as appear in defendant's exhibits, the slack of the saddle is never taken up except to keep the shape of the saddle, and you are perfectly well aware of the fact, are you not, that such taking up of slack, if it ever occurs, hasn't the slightest or remotest reference to bring the saddle in closer proximity to the driving wheel?

A. As to the first part of the question I would say, no, sir; I am not. As to the second part of it I would say that I am aware that the taking up of the slack will not bring the saddle into closer proximity to the driving wheel.

C. Q. 36. Did you ever see a velocipede like this Shire patent device?

A. Yes, sir.

C. Q. 37. Where? Who made it?

A. I saw it in Detroit, and I believe it was made by John Shire.

C. Q. 38. Kept as a curiosity, was it?

A. Well, I have seen several of them; in fact, I might say quite a large number. I saw several in use on the streets of Detroit last month.

C. Q. 39. Constructed exactly like the Shire patent?

A. I could not see that those which I examined differed in any material point.

C. Q. 40. In a velocipede constructed like this Shire device,
323 with the weight coming between two wheels and almost strain caused by the weight of the rider coming on the spring through which the forward end of the saddle is attached, it would be absolutely necessary, would it not, to have a saddle device that you could raise or lower to make it conform to the weight of each rider upon it?

A. No, sir; I do not think it would.

C. Q. 41. The two wheels of this Shire velocipede would never be the same distance apart with riders of unequal weight, would they?

A. I think the distance between the wheels would vary with the weight of the rider and also with the conditions of the roads over which the velocipede was propelled.

C. Q. 42. To bring the hammock seat "J" of this Shire patent in closer proximity to the driving wheel do you take up or let out the slack?

A. I should say you would let out the slack.

C. Q. 43. Does letting out the slack bring the seat closer to or farther from the rear wheel of the Shire patent?

A. In a velocipede constructed as shown in the Shire patent I should say that the letting out of the slack would bring that portion of the seat which supports the rider lower down, so that in ordinary cases it would bring closer proximity to both wheels.

C. Q. 44. Then you think, don't you, that you can bring the seat J of the Shire patent into closer proximity with the rear wheel without removing it farther away from the driving wheel?

A. In the velocipede, such as shown in the Shire patent, the seat is located considerably back of the center of the front or driving wheel and more nearly over the space between the wheels. I think,
under these conditions, that the increase in the slack of the
324 saddle would permit that portion which supports the rider to go farther down into the space between the wheels and thus in closer proximity to both, the proportionate distance that approaches the respective wheels varying with the location of the

saddle closer to or farther from a vertical line drawn through the center of the driving wheel.

C. Q. 45. Do you find anything in the Shire patent which points out or suggests of what material the hammock seat J is made of?

A. No, sir; I do not.

C. Q. 46. Don't you know that there is nothing to this hammock seat J of the Shire patent except the exact and specific construction there shown, necessitated by the peculiar form of velocipede device with which it is incorporated?

A. I do not.

C. Q. 47. In the Harris patent you find a hammock saddle, do you not, attached by its forward end to a spring, so far as the saddle seat itself is concerned, and that it is called a spring saddle, and is provided to be made of leather, is it not?

A. I find in the Harris patent a saddle which has a leather seat attached by its rear end to the cantle of the tree or frame and is suspended by its front end from a spring. I find that it is called a spring saddle, but I do not find anything in the patent to warrant me to call it a hammock saddle.

C. Q. 48. So you find that this saddle is adjustable as to its hammock portion by means of a nut and clamp and holes provided for adjusting or attaching the leather?

A. No, sir; I do not find anywhere in the patent a description of such a device.

325 C. Q. 49. No; but you find such adjustability or means for tightening the leather clearly shown in the drawing, do you not?

A. No, sir; I do not.

C. Q. 50. There would not be the slightest trouble, would there, in taking the block to which the rear end of the hammock of the Harris saddle is attached and calling it the block H of the Shire patent, fastening this block H to the fender F of the Shire patent, and hook or fasten the device of the Harris patent into the spring E of the Shire patent, and thus have substantially the hammock seat J of the Shire patent, providing I am correct in the assertion that such seat is adjustable as set forth in the former question?

A. I think you would have no difficulty in calling the rear portion of Harris' saddle frame H or anything else that you saw fit, but I think you would have serious difficulty in carrying out the rest of the operations named without badly mutilating the Harris saddle and rendering it entirely unfit for use as a saddle.

C. Q. 51. Will you explain to the court the slightest difficulty that any ignorant mechanic would have in simply substituting or transferring the hammock seat with its rear block to the Shire velocipede just as it stands?

A. If he had a drawing and description of the Shire patent or a device embodying his invention he would probably have no difficulty, by dismantling and mutilating the Harris patent, in producing from some of the parts of the Harris patent a saddle which would resemble in some of its features the Shire patented saddle, but without this knowledge I think an ignorant mechanic or even one

of ordinary ability—because he would not understand the conditions under which it was to work, the object it was to accomplish, or the functions it was to perform.

326 C. Q. 52. Would an ordinarily skilled mechanic in the construction of bicycles or velocipedes in the year 1878, and having before him the Shire velocipede device, without any saddle equipment of any kind, and having before him also the Harris patent, have the slightest difficulty or embarrassment, if he desired to place a hammock saddle in a bicycle, in transferring the hammock portion of the Harris saddle with its rear block to the Shire velocipede, substantially — shown in the Shire patent? Will you answer the question?

A. If he had already conceived the idea of a hammock saddle, such as shown in the Shire patent, he might, as I said before, without much difficulty, dismantle the Harris saddle and from some of the parts thereof construct a saddle which would resemble and embody the principles of the Shire saddle; but if he had not first conceived this invention or idea he would, in my opinion, have considerable difficulty in carrying out the operations or constructions set forth in your question.

C. Q. 53. Question repeated.

A. As I understand your question, one of the conditions under which the saddle is to be formed in the manner you have pointed out is to have a desire to form a hammock saddle on a velocipede. If the mechanic should have the desire to do this it would undoubtedly result from some object which he had in mind to accomplish; therefore my answer to the question was given in the form as it appears above. I will answer the question now, as I understand it, by saying that I believe a mechanic would have difficulty under such circumstances in producing a hammock saddle of the Shire patent without the aid of invention.

C. Q. 54. What possible difficulty could he have if he had
327 ordinary intelligence? Explain to the court what the difficulty would be.

A. If he wished to apply to the Shire device such a saddle as shown in the Harris patent, which you have termed a hammock saddle, he would most likely apply the entire saddle with its frame or tree in the same manner that bicycle saddles had been applied up to the date of the Shire invention. If he wished to make an adjustable hammock saddle, such as set forth in the Shire patent, he would not only have to dispense with this tree or frame, but would also have to supply some means to adjust said seat or saddle, for, as I understand it, no means are shown in the Harris patent for accomplishing this result. These are the difficulties which I see in the way, and to overcome these numerous difficulties will require invention.

Adjourned until Saturday, October 1, 1887.

Met pursuant to adjournment.

Present: Same as before.

C. Q. 54. The only adjustability of the saddle of the Shire patent consists of the fact that the saddle can be raised or lowered by the strap and buckle at its forward end, does it not?

A. The adjustment of the Shire saddle consists in increasing or taking up the slack, and thus raising or lowering the middle portions of the saddle or seat. I do not understand that the saddle as a whole is ever raised or lowered by this adjustment.

C. Q. 55. The hammock seat J of the Shire patent can be made of sheet metal if it has sufficient flexibility to be raised or lowered at its center by the strap and buckle, may it not?

328 A. I do not think that a saddle could be made of sheet metal so as to be adjustable in the manner and for the purpose set forth in the Shire patent.

C. Q. 56. Does it occur to you that the hammock seat J in the Shire patent could be made of cast iron, and if not secured tightly to the seat block H could be adjusted by the strap or buckle so as to bring it in closer proximity to the driving wheel?

A. It does not occur to me that a seat could be made of cast iron and by means of the strap or buckle, as set forth in the Shire patent, be adjusted in the manner described.

C. Q. 57. In the defendant's device to take up any slack in the saddle you have to lower the entire saddle down along the backbone, don't you?

A. No, sir; I think not.

C. Q. 58. Is there any possible way of taking up the slack in defendant's saddle except to carry the rear of the saddle down along the backbone and thus stretch the leather? Explain to the court how in defendant's machine.

A. I find in the defendant's machine means for separating or extending the spring supports to which the saddle is attached at the front and rear. This is accomplished by slipping the rear spring support backward through clamping devices secured to the backbone. The distance between the backbone and rear end of the saddle would remain practically the same, and as the backbone or perch is curved practically in an arc concentric with the driving wheel the same distance will be maintained between the rear end of the saddle and the driving wheel with reference to the ground line. I think this end of the saddle would be lowered by such an

329 adjustment; but the front end, as I understand it, remains at all times the same except for the elasticity of the spring which allows it to yield when in use.

C. Q. 59. Hammock seats were old at the date of the Shire patent, were they not?

A. Not to my knowledge.

C. Q. 60. The Shire patent itself, on its face, does not recognize them as old, does it?

A. I do not understand that it necessarily does. I understand

that Shire claimed as his invention an adjustable hammock saddle for velocipedes.

C. Q. 61. As I understand you, if the adjustable hammock seat J of the Shire patent should be found, for instance, upon a rocking horse it would not come under the second claim of the Shire patent. Am I correct?

A. I think you understand me correctly in this regard.

C. Q. 61. Have you ever seen a seat for bicycles made in accordance with Complainant's Exhibit Veeder Patent?

A. I do not think I ever saw a saddle embodying all the features of the Veeder patent referred to.

C. Q. 62. How many springs do you find supporting the saddle in defendant's machine?

A. Two.

C. Q. 63. As I understand you, you solicited and put through the Patent Office Complainant's Exhibit Kirkpatrick Patents. Is this correct?

A. Yes, sir.

C. Q. 64. Did you state Mr. Kirkpatrick's invention fully and clearly in that patent?

A. I think I stated it in language sufficiently clear that an ordinary mechanic skilled in the art could make and use the same.

330 C. Q. 65. Kirkpatrick states that his invention consists in a peculiar arrangement of front and rear springs secured independently to the reach or backbone of the machine in connection with the flexible seat suspended at the front and rear of said springs. State to the court, first, in what the "peculiar arrangement" of the rear springs of the Kirkpatrick consists.

A. The "peculiar arrangement" referred to in the specification consists of the arrangement of front and rear springs secured independently to the reach or backbone of the machine in connection with the flexible seat. I did not understand that, so far as the broad feature of applicant's invention was concerned, there was anything peculiar in arrangement of the rear spring *per se*.

C. Q. 66. What, if anything, is there peculiar *per se* in the arrangement of the front spring of the Kirkpatrick patent?

A. As it relates to the broad feature of applicant's invention, which is set forth in his first claim, I do not understand that there was any peculiar arrangement of this spring *per se*.

C. Q. 67. Simply as a matter of curiosity, state to the court what possible "broad claim" there can be in this Kirkpatrick patent and in what its "broadness" consists.

A. I think it is clearly set forth in Kirkpatrick's first claim, and I think its broadness consists in the fact that it is for independent front and rear springs secured directly to the perch or backbone in connection with the flexible seat in the manner set forth, without any regard to the shape, size, or construction of the springs, front and rear, and without any regard to the manner of attaching the same to the perch or backbone and without any limitation as to the manner of attaching the flexible seat directly to the springs.

331 C. Q. 68. Do you give in your testimony as to this Kirkpatrick patent, based upon the idea of the broadness of this first claim?

A. Yes, sir.

C. Q. 69. Have you any idea what would be the value or legal standing of a claim in a patent of the broadness to which you first referred?

A. My idea of it is that it is a very good claim as relating to bicycle saddles as used at the present day.

C. Q. 70. Do you find any suggestion or intimation in the Kirkpatrick patent that the peculiar arranged forward springs can be located in any other manner than at each side of the head of the machine?

A. I find, beginning with the line 40 in the printed copy of the specifications of the said patent handed me, a description of an arrangement of springs in seat by which the springs supporting the saddle are connected independently to the front and rear directly to the perch or backbone. I find that in this description that each spring is "preferably secured as nearly as practicable under the end of the saddle to which said spring is attached." I find that the rear spring is preferably made of flat steel, from the fact that applicant has pointed out methods which he regards as preferable only for carrying out his invention. I understand that he intends to carry it out or apply it to various other ways which might afterwards or which at the time suggest themselves. This part of the description between lines 40 and 60 of the printed copy seems to describe in general terms only the construction set forth in the first claim, as I have construed it. The objects and purposes of this portion of the invention are stated here. Following this ap-

332 plicant sets forth other objects to be accomplished by specific forms of springs and other parts, and proceeds to describe them specifically, and these specific constructions are made the subject-matter of other claims following the first claim. This suggests clearly to me that applicant had in mind at the time of making his application other arrangements of the springs besides the specimen referred to in the question.

C. Q. 71. You find, do you not, that the patentee distinctly states that "I construct the said spring with two wings, b^1 b^2, adapted to extend forward at the head B," and that is the only modification he shows; the only other form of construction is in figure 4, and there he has this same peculiar arrangement?

A. I find, following that portion of the description to which I have just referred, that applicant says: "In order to extend the suspended flexile seat as far forward as possible and at the same time secure the full elasticity of the forward spring D, I construct the said spring," etc., as counsel has quoted. I find that the modification referred to in figure 4 relates to this portion of the invention.

C. Q. 72. Can the invention of the first claim of the Veeder patent in suit and the first claim of the Kirkpatrick patent be both embodied in the same bicycle saddle?

A. If my present understanding of them is correct, they can.

C. Q. 73. One of the objects of the invention of Kirkpatrick was to take the springs out from under the saddle seat, so as to leave the space under the saddle entirely free, was it not?

A. Yes, sir; that is, it was to connect the springs directly
333 to the backbone at the front and rear, so that this space under that portion of the saddle occupied by the rider under ordinary riding circumstances would be free and unobstructed except by the backbone or perch.

C. Q. 74. Is adjustability any element of the first claim of the patent?

A. No, sir; I think not.

C. Q. 75. If the same identical construction in the Kirkpatrick patent was found as the saddle seat on a rocking horse, would such construction be an infringement under the first claim of the Kirkpatrick patent?

A. I do not think it would.

C. Q. 76. The rear spring in defendant's saddle is wholly and directly under the saddle, is it not?

A. As shown in this exhibit, Defendant's "American Champion" Bicycle, the rear spring seems to be entirely under the saddle.

PAUL A. STALEY.

JOHN E. EARLE, the next witness produced to testify in rebuttal on behalf of complainant, first being duly sworn, testified, in answer to questions asked him by respective counsel, as follows, to wit:

Q. 1. Are you the same John E. Earle who formerly testified as an expert in this cause?

A. I am.

Q. 2. Have you read the depositions of Mr. Jeffery and Mr. Powers, the defendants' experts in this cause, and examined carefully the various patent and model exhibits introduced by the defendants in connection with their depositions as showing devices tending to anticipate inventions contained in the complainant's patents involved in this suit; and, if so, do you understand them?

A. I have, and believe I do.

334 Q. 3. Please take up Defendant's Exhibit Harris 1875 Saddle Patent, Defendant's Exhibit Schmidt 1871 Saddle Patent, Defendant's Exhibit Lamplugh & Brown 1878 Saddle Patent, and Defendant's Exhibit Curry 1867 Saddle Patent and compare the mechanisms shown and described in each of these defendant's exhibits with the mechanisms and devices shown and described in Complainant's Exhibit Shire Patent, and specifically made the subject-matter of the second claim thereof, pointing out to the court their similarities and differences, giving your reasons for such opinions as you may express.

A. The saddle of the Shire patent is correctly designated as a hammock seat for a velocipede. It is proper for me to first point out the distinction between a hammock seat or saddle and a suspension seat or saddle.

A hammock seat or saddle is one in which the seat proper is made from a flexible material, as leather, and which is hung at its rear and forward ends in such manner that the tension of the seat may be adjusted after the manner of adjusting a hammock—that is to say, the two ends of the seat are so hung that the tension of the seat may be made greater or less, so that more or less depression may be permitted to the seat, according to the convenience or desire of the rider.

A suspension seat or saddle is one in which the seat proper is secured at its two ends permanently or so that no adjustment may be made whereby a greater or less depression may be produced in the seat—that is to say, a flexible seat is simply suspended by its two ends, with no provision for adjustment.

It is also proper for me, at the outset, to distinguish between a velocipede saddle and a common riding saddle adapted to be applied to the back of a horse.

335 In a velocipede the foot bearings are independent of the saddle and constantly varying, one foot moving up and down while the other moves down and up, and because of this peculiarity of the foot rests no adjustment of the foot rests can be made with relation to the saddle other than that of lengthening or shortening the cranks. In lengthening the cranks the feet are brought nearer the saddle on the rise and go farther from the saddle on the descent; hence no adjustment of the cranks can be made with relation to the saddle without at the same time changing the length of the cranks. This fact is due to the independence of the foot rests.

In a common riding saddle the foot rests or stirrups are attached directly to the saddle, and once adjusted do not change their relation to the saddle. There can be no movement of the feet upon the foot rests of a common riding saddle, as there must be in the foot rests of a velocipede; in a common riding saddle the foot rests are practically a part of it, and their relation to the saddle or seat is unchanged.

Understanding these distinctions between a suspension and a hammock seat or saddle and between a common riding saddle and the saddle or seat in a velocipede, I proceed to the consideration of the Harris patent referred to in the question.

The saddle in the Harris patent consists of a tree adapted to rest upon the back of a horse; this tree is provided at its forward end with a spring above the tree, which practically forms the pommel of the saddle; the free end of this spring is in the form of a hook; the seat is made in two pieces, the division being longitudinally through the center; these two pieces are screwed at the rear

336 to an upward projection from the tree; at the forward end the two pieces are connected by a metal loop adapted to be hung upon a hook on the free end of the spring and so that the seat will be suspended above the tree and leave the seat free between its rear and forward points of suspension.

The attachment of the loop to the parts of the seat is permanent and inadjustable; this seat is therefore a suspension seat and not a hammock seat.

I take into consideration the fact that Mr. Jeffery says this seat is adjustable, and therefore a hammock seat. His reason for this conclusion is not drawn from anything in the specification, because the specification practically contradicts this assertion, for it provides a hook connection between the spring and seat, so that the seat may be entirely disconnected from the spring and the suspension seat permitted to drop or lie directly upon the tree, and whereby the seat is converted from a suspension seat to an ordinary or rigid seat.

Mr. Jeffery's reasons for inferring that the seat is made adjustable as to its length is that he discovers what he calls "two holes" in the seat in the rear of the balls by which the seat is secured to the loop.

There is nothing in this specification to warrant this conclusion, nor do the figures in the drawing correctly illustrate what he calls "holes," if they are holes. The relative position of what Mr. Jeffery calls holes to the respective balls is different on the two sides. The assumption of Mr. Jeffery that this saddle seat is adjustable is wholly unwarranted by anything in the specification or drawings. The patent shows only a suspension seat for a common riding saddle, made elastic at the pommel end and convertible from an elastic seat to a rigid seat.

337 I consider, second, the Schmidt patent: This patent exhibits and describes a common riding saddle with a suspension seat, the pommel and cantle of which are made in the shape of bows corresponding respectively to the usual shape of the rear and forward ends of the common saddle; the seat of this saddle is made from leather, and, as stated in the specifications, "is suspended between the cantle and pommel, to which its respective ends are buttoned or otherwise attached." This forms a suspension seat and not a hammock seat; there is no adjustment indicated or even hinted at whereby the seat may be adjusted to give it a greater or less depression between the two points of attachment; once applied it retains its position and cannot be changed.

I take into consideration the fact that Mr. Jeffery construes the statement in the specification that the "respective ends are buttoned or otherwise attached" to include straps or buckles, but this is, in my opinion, an unwarranted assertion, first, because the attachment of the seat by straps and buckles would be an impracticable one; and, second, because the attachments are represented and evidently intended to be an inadjustable one, and that nails, rivets, screws, or their equivalents can be understood as the only "otherwise" attachment referred to by the inventor in the specification.

In a riding saddle of this character there is no occasion for adjustment, as I have before described, to produce a greater or less depression in the seat, for the reason that the stirrup straps offer to this class of saddles a much better means of adjustment of the foot rests with relation to the saddle than the adjustment of the seat could offer.

Third, I consider the Lamplugh & Brown patent: This patent illustrates and describes a saddle seat for bicycles, and the seat represented and described is a "suspension seat" and not a hammock seat.

338 The seat proper is described as made from a flexible material, as leather, etc.; beneath it is a plate presenting a concave shape on its upper side and extending from the front to the rear of the flexible seat; the forward and rear ends of the flexible seat are permanently and inadjustably secured to the respective ends of the plate beneath, substantially as is the seat to the tree in the Schmidt patent last referred to, and the plate to which the flexible seat is secured in the Lamplugh & Brown patent is substantially a tree. The plate upon which the flexible seat is suspended is represented in figures 1 and 2 and described as secured to a spring bar over the backbone of a bicycle. This flexible seat is in no sense adjustable with relation to its two points of attachment; its depression can in no way be varied, but is and must be constant. This seat is, therefore, simply a "suspension" seat applied to a bicycle and in no sense an adjustable hammock seat.

In figures 6 and 7 of this Lamplugh & Brown patent a modification of the attachment of the suspension seat to the bicycles is illustrated, and the specification describes briefly this modification, the object of the modification being to dispense with the spring bar over the backbone.

Under the modification of figures 6 and 7, instead of arranging the suspension seat upon the spring bar, the spring bar is omitted and a spring bracket is attached to the rear, directly to the backbone, and extends upward from the backbone; the rear end of the plate upon which the seat is suspended is secured to the upper end of this spring bracket at the forward end; the plate is hung to a screw in the head of the machine, which is adjustable longitudinally, so that

339 the seat may be drawn forward to increase the tension of the spring bracket or by unscrewing the attachment at the forward the tension of the spring at the rear may be reduced, but under this adjustment of the spring at the rear the seat as a whole necessarily moves bodily forward or rearward, as the case may be, without possible effect upon the tension of the flexible portion of the seat, that flexible portion remaining always the same because of the attachment at its forward and rear ends to the plate beneath. This patent, therefore, shows a suspension saddle seat for a bicycle, but in no sense shows an adjustable hammock seat—that is to say, it does not show a seat made of flexible material which is adjustable between its front and rear connections so as to vary the depression of the seat between the same two points of attachment. Mr. Jeffery is in error in his statement that the screw of the Lamplugh & Brown patent is to stretch the leather, as the screw can have no possible effect upon the leather; it simply draws the seat as a whole and bodily toward the head or permits the seat to recede from the head, as I have described.

Fourth, the Curry patent: This patent illustrates and describes a common riding saddle having a flexible seat suspended over the tree and rigidly connected thereto at the pommel and cantle ends. Like the Harris patent and the Schmidt patent, the flexible seat of this Curry patent is inadjustable between its two points of connection with the tree; consequently a depression of the flexible portion

of the saddle is invariable, and this patent, so far as this case is concerned, shows, as I understand it, only substantially the same saddle which is found in the Harris and in the Schmidt patent. Mr. Jeffery understands the "stitches" or "thongs" by which the flexible seat is secured to "perform the work of the buckle and strap of
340 the Shire patent;" in this he is in error, for the thongs and stitches make a permanent and inadjustable attachment, as do buttons, nails, screws, or rivets, and in no sense permit adjustment.

Coming now to the Shire patent, I find in this patent not a "suspension" seat, but a "hammock" seat. A "hammock" seat necessarily implies, as I have before stated, such an adjustment of the seat as will permit a greater or less depression between the points of connection or support at the front and rear.

The Shire patent illustrates and describes the adjustable hammock seat as rigidly secured to a seat block at the rear. The means for rigidly securing this seat to the block I understand to be the buttons, thongs, or stitches or their equivalents, which I have referred to in connection with the before-mentioned patents.

At the forward end the seat is supported by an adjustable connection, and this connection is represented a strap and buckle. By means of this strap and buckle the tension of the seat between its two points of connection may be made greater or less and by which adjustment a correspondingly less or greater depression will be made in the seat between the two points of connection.

The essential difference between the seat of the Shire patent and seat of the four patents to which I have just referred resides in the fact that whereas each of the said four patents show- a seat which is inadjustably suspended between two points and so that the shape of the seat is unchangeable, the seat of the Shire patent is made adjustable between its two points of support and whereby the tension of the said seat of the said Shire patent may be varied, while in each of the said four patents the tension of the seat is invariable.

The seats of the said four patents are "inadjustable suspen-
341 sion" seats, and the seat of the said Shire patent is an "adjustable hammock" seat.

For the reasons which I have given I do not find the invention of the second claim of the Shire patent for the adjustable hammock seat for a velocipede in either of the said four patents, to wit, Harris, 1875; Schmidt, 1871; Lamplugh & Brown, 1878, and Curry, 1867.

Q. 4. Please take up next complainant's patent Exhibit Veeder Patent and the defendant's exhibits experted as anticipating the Veeder invention, viz:

Defendant's Exhibit Salamon 1879 Saddle Patent;
" " Fowler 1880 " "
" " Shire 1879 " "
" " Miller 1886 " "
" " Nelson 1860 " "
and the " " Model Nelson "
and compare the devices of the said defendant's exhibits with the

Veeder invention as specified in the first claim of said Veeder patent, referring in said comparison to the opinions expressed by defendant's experts, both as to the mechanism shown in defendant's patent exhibits and model exhibit, and point out the similarities and differences between the defendant's exhibit- and the complainant's Veeder patent, giving your reasons for such opinions as you may express.

Recess until 2 o'clock p. m.

A. The Veeder patent describes a saddle the seat of which is made of leather or other flexible material, and the seat is secured upon a support made in two parts, one part made fast to the forward end of the seat and the second part made fast to the rear end of the flexible seat. The two parts thus carrying the
342 seat are separate and distinct parts, and because of being so separate and distinct the one from the other in contradistinction to being made in a single piece the said parts are adapted for adjustment with relation to each other and so that the points of the said parts where the respective ends of the flexible seat are secured may be brought nearer together or further apart, as may be desired. By bringing the two parts nearer together, so as to shorten the distance between the points of connection with the seat, the slack of the seat will be increased accordingly. If, on the contrary, the said parts be moved in the opposite direction, the distance between the points of connection with the seat will be increased and the slack of the seat taken up accordingly. In this Veeder seat, then, because of the adjustability of the supporting points for the seat, whereby more or less slack may be given to the flexible seat, the seat of the Veeder patent is a "hammock" seat in contradistinction to a "suspended" seat.

As I have stated in my original testimony in this case, I understand the first claim of the Veeder patent to be for the flexible seat hung by its respective ends to a support in two parts, which two parts are adapted for adjustment to increase or shorten the distance between the points where the flexible seat is attached, and this irrespective of any particular means for securing the said two parts to the bicycle.

Mr. Jeffery, in giving his understanding of the invention of the first claim of the Veeder patent, includes as the elements of that first claim the peculiar devices shown and described in the Veeder patent as the means for adjusting the supporting parts of the saddle; but Mr. Jeffery is in error in thus including those adjusting devices in the first claim, first, because the claim particu-
343 larly excludes any special adjusting devices, and, as I understand it, limits the supporting parts of the seat only by the fact that they must be adjustable in their relation to each other; and, second, because such an understanding of the first claim as Mr. Jeffery entertained makes the first claim identically the same as the second claim, whereas the second claim specifically includes adjusting devices, while the first claim excludes adjusting devices.

From Mr. Powers' testimony I do not understand that he differs

from me in the understanding of the invention of the Veeder patent as recited in either the first or second claims.

I now consider the patents referred to in the question and offered by the defense as anticipating the Veeder patent. First, the English patent of Salamon, 1879: The saddle of this patent, as I understand it, was at that time known as a common inflexible saddle—that is, a saddle which was made on a form or tree of some hard or unyielding material and such as found in "Complainant's Exhibit Illustrative Velocipede Saddle No. 1." The saddle is secured by a clip to an elastic or spring bar arranged over the backbone of the bicycle, the said bar being supported at its forward and rear ends. The clip connection between the seat and spring bar permits the adjustment of the seat bodily backward and forward on the said bar. The said exhibit, "Complainant's Exhibit Illustrative Velocipede Saddle No. 1," clearly illustrates this means for adjusting the seat, well known in 1879, and substantially the same as that exhibited in the said Salamon's patent.

The peculiarity of the Salamon patent resides solely in the means for suspending the ends of the saddle bar. A bracket is applied to the backbone forward of the saddle, and a second bracket is
344 applied to the backbone in the rear of the saddle. These brackets carry vertical bolts, in which the respective ends of the saddle spring are arranged. Several India-rubber washers or collars are arranged upon each bolt beneath the respective ends of the saddle spring. These washers provide a means for the adjustment of the seat nearer to or farther from the backbone by placing more or less of the washers below the ends of the saddle spring; the less number of washers bring the seat nearer to the backbone, and *vice versa*.

The saddle of this Salamon patent is not a flexible seat, and consequently has no means for adjusting its length whereby a greater or less depression may be produced midway of the length of the saddle. The saddle is adjustable bodily, but it is in no sense the saddle of the Veeder patent, nor can the adjustment produced by the Veeder patent be attained by a structure like that shown and described in the Salamon patent. The saddle of the Salamon patent is of entirely a different class from that of the Veeder patent.

Mr. Jeffery, in his testimony regarding the Salamon patent, appears to find therein the "suspension saddle," "an under spring in two or more parts, to which the flexible portion is attached at either end, and which metallic parts are extensible," substantially as decided in the first claim of the Veeder patent. This, as I understand it, is the most unwarrantable interpretation of the Salamon patent, first, because the saddle of the Salamon patent is not a suspension saddle, and, secondly, because there is no extensibility of any character. Evidently Mr. Jeffery considers the spring which supports the saddle as the flexible portion, but, waiving the impropriety of such an understanding of the supporting spring of the Salamon patent,
345 the bearings which support that spring are in no sense adjustable with relation to each other. Mr. Jeffery, however, admits that in the Salamon patent "there is no means shown for ex-

tending the metallic portion." I cannot agree with Mr. Jeffery regarding the bearing of the claims of the Salamon upon the Veeder patent, but, on the contrary, it has no bearing upon the Veeder patent further than it illustrates the difficulties of a rigid and inadjustable saddle which naturally led to the Veeder invention.

Mr. Powers, if I rightly understand him, fully agrees with me in my understanding of the Salamon patent and the bearing which it has on the Veeder patent.

Second, the Fowler patent: The Fowler patent exhibits a saddle and a saddle spring substantially like that found in "Complainant's Exhibit Illustrative Velocipede Saddle No. 1," differing only therefrom in the means for suspending the forward end of the saddle spring. The saddle seat in the Fowler patent is adjustable on its spring the same as the said Exhibit "Velocipede Saddle No. 1." The seat is rigid and inflexible, and the machine exhibits no possible means of adjustment of the seat itself whereby the shape of the seat may be changed, as is done in the Veeder patent, by adjusting the points of support. In fact this Fowler patent, in my opinion, exhibits nothing bearing upon the first claim of the Veeder patent or in any sense tending to qualify the invention reciting that claim. Mr. Jeffery is in error in stating that this patent shows a "suspension saddle," for the patent exhibits, as I have stated, quite the contrary. He very wisely states that it does not exhibit the invention of the first claim of the Veeder patent because of the absence of the adjustability required by that claim, but it not only lacks that adjustability, but it lacks every essential feature of that claim.

346 Mr. Powers, if I rightly understand him, finds in the said Fowler patent the only anticipation of the first claim of the Veeder patent, but to do this he says the Fowler patent contains the suspended flexible saddle, but the Fowler patent has no flexible saddle or any equivalent for it, as I before stated. Mr. Powers is therefore in error both as to his premises and to his conclusions regarding the Fowler patent.

Third, regarding the Shire patent: It is true the Shire patent illustrates an adjustable "hammock" seat, and it is equally true that the Veeder patent shows an adjustable "hammock" seat, and it is also true that if the first claim of the Veeder patent was to be construed as broadly for a flexible seat made adjustable so as to increase or diminish the slack in the said seat, the said Shire patent would clearly show an anticipation of that claim under such interpretation. The seat of the Shire patent differs from the seat in the first claim of the Veeder patent principally in the fact that whereas in the Shire patent the two points where the seat is attached at the front and rear are inadjustable with relation to each other, the seat being adjustable by increasing or diminishing its own length, in the Veeder patent the points at the front and rear to which the seat is attached are adjustable with relation to each other without changing the length of the seat, and, as I understand it, it is this improvement upon Shire which Veeder made, and which consisted in separating the two points of suspension for the seat, so that those two points are made adjustable with relation to

each other, and which improvement, as I understand it, constitutes the invention recited in the first claim of the Veeder patent.

347 I do not wish to be understood as expressing the opinion that the Veeder patent does not embody the invention of the Shire patent as recited in the second claim of the said Shire patent, but, on the contrary, that in my opinion the said Veeder patent clearly embodies the invention recited in the said second claim of the said Shire patent.

I do not understand that Mr. Jeffery claims to find in the said Shire patent the invention described and claimed in the Veeder patent, and certainly I am not to understand that Mr. Powers entertains any such opinion.

Fourth, the Miller patent: This Miller patent exhibits a common riding saddle. In it there is a seat suspended above the tree, but this seat is a rigid, inflexible seat, the inflexible seat being supported at the front and rear by springs substantially resting on the tree. There is no adjustment of any character, no flexible seat, and nothing exhibited or described in said patent which has the slightest bearing on either of the claims of the Veeder patent, and in this opinion I am confirmed by the omission of Mr. Powers to express any opinion upon the said Miller patent, and practically so by the testimony of Mr. Jeffery, who finds in this Miller patent simply "a suspension saddle supported at its respective ends upon springs." Mr. Jeffery is of the opinion that these springs may be extended, but just how or for what purpose such extension might be made he is evidently at a loss to explain, but is of opinion that no means for adjustment are found.

Fifth, the Nelson patent: This patent exhibits, as I understand it, a common riding saddle, having a tree with a metallic seat. This metallic seat is evidently sheet metal, and is made in shape substantially as the shape of a common riding saddle. At its

348 forward end the seat is provided with a hook to engage an upward projection at the forward end of the tree, and is also provided with a lip on its under side to stand in the rear of the said projection and so as to hold the said seat hooked to the said projection on the tree, and said seat extending rearward over the tree, but so as to leave a space between the seat and tree. The seat itself is inelastic or inflexible.

Between the seat and tree two India-rubber springs are described as arranged to support the seat above the tree and so as to give elasticity to the seat. These springs are connected to both the tree and the seat by corresponding longitudinal under-cut grooves, the springs at their upper and lower ends being adapted to engage with said grooves so as to form a connection between the seat and tree in order that the seat may be held to the tree. The said springs are made adjustable in the said longitudinal grooves, so that they may be set at varying distances from the pommel according to the requirements of the rider.

This patent does not illustrate or describe a flexible seat or a suspension seat; it has no support of any character at its rear end, nor does it show any of the characteristics of the Veeder patent, as set

forth in either the first or second claims thereof. I do not understand from Mr. Jeffery's testimony that he entertains an opinion that the said Nelson patent has practically any bearing upon the invention of the Veeder patent, as recited in the first and second claims. Nor do I understand that Mr. Powers is willing to state that he finds anything in the said Nelson patent to anticipate or qualify the said first and second claims of the said Veeder patent.

349 Referring now to Defendant's Exhibit Model Nelson Patent, which Mr. Jeffery testifies represents "the Nelson saddle device as shown by his patent;" but this model I find to be an entirely different structure than that of the said Nelson patent. It is different in the shape of the seat, in the shape of the tree, the seat of the Nelson patent having substantially the same shape longitudinally as tree (see figure 3 of the Nelson patent). In this model, instead of the seat being hooked over a rigid projection at front of the seat, as in the patent, it is rigidly secured to one end of a U-shaped spring, the other end of the spring being made fast to the tree. Again, no connection is made in the model between the sgrings and seat as in the patent. Again, the movement of the springs for adjustment is only from a point about one-third of the length of the saddle from the front forward, whereas in the patent adjustment is from about the same point rearward, so that in this model the support of the springs is necessarily carried to a point far in advance of the supporting point in the patent. This model illustrates in a very crude manner its method of adjusting the springs shown in the Nelson patent, but does not correctly represent the structure as a whole.

Q. 4. Please examine now the following patents, which the defendant's experts experted as containing in some form the inventions of Kirkpatrick, viz:

Defendant's Exhibit		Fowler	1880	Saddle	Patent,
"	"	Veeder	1882	"	"
"	"	Bishop	1859	"	"
"	"	Miller	1866	"	"
"	"	Curry	1867	"	"
"	"	Duryea	1884	"	"

and compare the mechanism shown and described in each of said exhibits and as represented in the model exhibits offered in

350 connection with said patents with the mechanisms shown and described in Complainant's Exhibit Kirkpatrick Patent and made the subject-matter of the first claim thereof, pointing out their similarities and differences, referring in connection therewith to the opinions of the defendant's experts touching said patent and model exhibits, and give your reasons for such opinions as you may express.

A. As I have stated in my original testimony, I understand the first claim of the said Kirkpatrick patent to include as elements of a combination, first, a flexible seat; second, two springs, one secured directly to the backbone of the bicycle at the front, and the other spring secured directly to said backbone at the rear, the front and rear ends of the said flexible seat being secured to the said springs

respectively, one of said springs being secured directly to the backbone in such manner that it may be adjusted toward or from the other spring to correspondingly reduce or increase the slack of the saddle.

By the adjustment of the said two springs, which are connected directly to the backbone, the seat becomes what I have described as a "hammock" seat in contradistinction to an inadjustable "suspended" seat. In this Kirkpatrick patent, then, as I understand it, I find the "hammock" seat of the Shire patent differing from the Shire patent in the same manner that the seat of the Veeder patent differs from the seat of the Shire patent and as I have fully described.

The Kirkpatrick patent differs from the Veeder patent in the manner of its attachment to the machine, but it is like the Veeder patent in that there is the flexible seat and an under spring or support made in two parts and to which the respective ends of the flexible seat are attached, the said supports being extensible to
351 increase or diminish the distance between the two points where the seat is attached. Thus the Kirkpatrick saddle, as I understand it, embodies, first, the invention of the Shire patent in that it possesses an adjustable "hammock" seat of the second claim of the said Shire patent, and it also embodies the invention of the Veeder patent in that it contains the flexible seat and two separate supports therefor, said supports being adjustable, and which said invention is recited in the first claim of the said Veeder patent.

The invention of the Kirkpatrick patent, then, as I understand it, is an improvement upon both the Shire patent and the Veeder patent; this improvement consisting, as I understand it, in attaching the two seat supports directly to the backbone, instead of by means of intermediate mechanism described and shown in the Veeder patent.

Referring now to the defendant's exhibits, patents mentioned in the question—first, the Fowler patent, which I have heretofore fully described: I find a seat, rigid and inflexible, adjustably supported on a spring bar, the said bar being supported at its forward end upon the vertical head of the machine and at its rear end by means of a bracket, which bracket is secured to the backbone. This Fowler patent lacks the adjustable seat required by the first claim of the Kirkpatrick patent; it is not supported directly from the backbone, nor is there any possible adjustment of the supporting parts or the parts themselves corresponding to the supporting parts of the Kirkpatrick patent. In the Fowler patent, therefore, there are not, in my opinion, the elements of the combination recited in the first claim of the Kirkpatrick patent or any substantial equivalent therefor. In this opinion regarding the Fowler patent
352 I am substantially confirmed by Mr. Jeffery, who evidently fails to find in the said Fowler patent anything to qualify the first claim of the Kirkpatrick patent, and also by Mr. Powers, who expresses his opinion in regard to the bearing of the Fowler patent upon the Kirkpatrick patent.

Adjourned to 10 a. m., October 5, 1887.

OCTOBER 5, 1887—10 a. m.

Resumed.

Present as before.

Second, the Veeder patent: It is true of this Veeder patent that there is substantially the same flexible seat as found in the Kirkpatrick patent, and that there is also a spring at the front and rear, to which the forward and rear ends of the said seat are respectively secured as in the Kirkpatrick patent; but in the Veeder patent the two springs or supports for the flexible seat are attached to the backbone of the bicycle—not directly but indirectly—through the interposition of devices illustrated and described in the said Veeder patent, differing from the Kirkpatrick patent in the attachment of the supporting springs. In the Kirkpatrick patent, as I have before described, the seat-supporting devices are independent of each other, but both are attached directly to the backbone of the bicycle without the interposition of mechanism, as in the Veeder patent.

There is the same independence of the seat supports of each other in both the Kirkpatrick and Veeder patents, and in both said patents there is an adjustment between the two seat supports so that by such adjustment the slack of the seat may be increased or diminished. The Veeder patent lacks the essential feature of the first claim of the invention recited in the first claim of the Kirk-
353 patrick patent, to wit, the attachment of the seat supports directly to the backbone, and therefore do not find the invention of the first claim of the Kirkpatrick patent in the Veeder patent.

In this opinion regarding the bearing of the Veeder patent upon the Kirkpatrick patent Mr. Powers appears to agree with me. Mr. Jeffery also appears to agree with me in this opinion, for he simply finds in the Veeder patent that the seat is suspended from front and rear, and recognizes the fact that in the Veeder patent the springs are indirectly connected to the backbone instead of directly, as required by the first claim of the Kirkpatrick patent.

Third, the Bishop patent: This patent illustrates a common riding saddle, consisting of a tree to rest upon the back of the horse with a "suspension" seat supported at its front and rear upon springs inadjustably and permanently secured to the respective ends of the tree.

This patent exhibits no backbone corresponding to the backbone of the velocipede, but it exhibits a device between the suspension seat and the back of the horse as a means for securing the seat upon the horse.

A direct connection of the front and rear seat supports to the back of the horse is impractical; something intervening to which the seat may be attached is necessary. Again, in this Bishop patent the seat-supporting devices are wholly inadjustable with relation to each other.

The said Bishop patent, therefore, does not, in my opinion, contain the invention of the Kirkpatrick patent, as recited in the first claim thereof, or any substantial equivalent therefor, nor is the saddle of the Bishop patent in any sense adapted to the use of the bicycle.

354 Mr. Jeffery appears to consider the tree of the Bishop saddle as the perch or backbone of the bicycle, but in this I think Mr. Jeffery is in error, for the tree is the means through which the saddle is secured and not the thing to which it is secured. I agree with Mr. Jeffery that the springs of the Bishop saddle may operate as elastic supports for the flexible seat in a manner similar to the Kirkpatrick patent, but Mr. Jeffery is in error in his conclusion that the springs of the Bishop saddle "perform all the functions" described in the Kirkpatrick patent, for the springs of the Bishop patent lack the adjustability of the springs of the Kirkpatrick patent, whereby the tension or the slack of the seat may be varied.

Mr. Jeffery introduces a model which he says illustrates "fully the construction and operation of the Bishop saddle." The said model is marked "Defendant's Exhibit Bishop Patent."

The said exhibit, Bishop model, is not a correct representation of the Bishop saddle. It has no tree by which it may be secured to the back of the horse, but, on the contrary, show- simply a plain straight bar.

Instead of representing a flexible seat, like the seat of the Bishop patent, the model contains a flexible bicycle seat not adapted as a seat for a common riding saddle.

The forward spring in the Bishop model, instead of being a solid spring post, as at the rear, and as in the Bishop patent, is made as a bifurcate spring. Again, instead of making permanent connections between the seat and springs, as in the Bishop patent, the connections in the Bishop model are made by means of detachable hooks on the flexible seat. From the fact of these differences between the

355 Exhibit Bishop Model and the illustration and description of of the Bishop patent, I say the said Defendant's Exhibit Bishop Model is not a correct or fair representation of the saddle of the Bishop patent, but I find in Complainant's Horse Saddle Exhibit No. 8 a true and correct illustration of the saddle of the Bishop patent.

Mr. Powers recognizes the difference between the saddle of the Bishop patent and the invention recited in the first claim of the Kirkpatrick patent, but does not consider these important differences material. In this I do not agree with him, for the reasons which I have heretofore stated in comparing the Bishop and Kirkpatrick patents.

Fourth, the Miller patent: I have heretofore described this invention in reference to the Veeder patent. It is a common riding saddle and possesses nothing in common with the Kirkpatrick patent further than the fact that springs are provided for the support of the front and rear ends of the seat, the springs being attached to the tree, as in the Bishop patent. The seat is inflexible and possesses no means for adjustment and has, in my opinion, no bearing whatever upon the invention of the Kirkpatrick patent, as recited in the first claim thereof.

I do not understand Mr. Jeffery to state as his opinion that the said Miller patent anticipates the invention of the first claim of the Kirkpatrick patent, but simply to say that the seat is supported upon

springs at front and rear in a manner similar to the support of the seat in the Kirkpatrick patent, and in this opinion Mr. Powers confirms him by taking substantially the same view of the Miller patent, except that Mr. Powers considers the seat a flexible seat, but in this latter opinion Mr. Powers is in manifest error, as the seat is rigid and not flexible.

Fifth, the Curry patent: I have heretofore pointed out
356 the peculiarities of the saddle of this patent in connection with the Veeder patent. It is a common riding saddle, and as it possessed nothing in common with the Veeder patent, except flexibility of the seat, it possesses nothing further than the flexible seat in common with the Kirkpatrick patent, and in my opinion the said Curry patent contains nothing to qualify the invention of the Kirkpatrick patent, as recited in the first claim thereof.

The error of Mr. Jeffery in comparing the Kirkpatrick invention with the Curry patent is too apparent to require any particular description or comparison of the two patents. He calls the tree of the Curry patent "the perch," and says the Curry saddle contains springs at the front and rear, substantially as in the Kirkpatrick patent; but, as I have before described, the tree of the common riding saddle cannot properly be understood to be the backbone of the bicycle any more than it can be considered a part of the horse to which the saddle is to be applied. The springs of the Curry patent, if any there be, are not the springs of the Kirkpatrick patent, and there is no possible adjustment of the flexible seats of the Curry patent, as I have before shown. Mr. Powers very wisely omits any reference to the Curry patent as bearing upon the Kirkpatrick patent.

Sixth, the Duryea patent: This patent illustrates the saddle of a bicycle secured to the backbone. The seat of the saddle is a flexible seat and is secured to a support at its front and rear ends, which supports are in one and the same piece, so that there is no possible adjustment between the said two supports to vary the tension of the saddle; consequently the seat of this Duryea patent is a "suspension" seat in contradistinction to a "hammock" seat necessary to the invention of the Kirkpatrick patent.

In the Duryea patent the supporting piece on which the
357 saddle is suspended is elastic and forms a spring at the front and rear, but this spring, being one continuous piece, cannot properly be understood to be two independent springs, one at the front and the other at the rear, and which independent springs, as in the Kirkpatrick patent, permit the adjustment of the seat supports with relation to each other, which adjustment is impossible in a construction of supports like that shown in the Duryea patent.

From the fact of the essential differences which I have pointed out between the saddle of the Duryea patent and that of the Kirkpatrick patent I am of the opinion that the Duryea patent does not contain the invention of the Kirkpatrick patent as recited in the first claim thereof.

I do not understand that Mr. Jeffery finds in the Duryea patent the independence of the front and rear springs called for by the

first claim of the Kirkpatrick patent, but that, on the contrary, he admits the absence of this essential independence when he says that the front ends of the single spring of the Duryea patent act independent of each other only in the elastic character, and not such independence as will permit the adjustment of one support in relation to the other. Mr. Powers contents himself in the comparison of the Duryea and Kirkpatrick patents by suggesting a change in the construction of the seat support of the Duryea patent, which would bring it within the first claim of the Kirkpatrick patent.

Q. 5. Please examine the machine exhibits which represent machines manufactured by the defendants and state whether the old patents offered in evidence by the defendants reveal such a condition of the state of the art of bicycle and tricycle saddle inventions as would cause you to modify in any way your views ex-
358 pressed in your direct examination with reference to whether the saddles of the defendants' machines contain substantially the same elements which you found specified in the various claims of the complainant's Shire, Veeder, and Kirkpatrick patents which you found to be infringed, and point out to the court in what respect your views in that regard differ from or correspond with the views of defendants' experts, giving your reasons for such opinions as you may express.

A. In my original testimony I found in the four exhibits, "American Champion Bicycle," "American Light Champion Bicycle," "Ideal Bicycle," and "Ideal Tricycle," the "hammock" seat shown and described in the Shire patent, and as particularly recited in the second claim thereof, for the reason that in each of said exhibits the seat is of a flexible character (leather) and is supported at its front and rear ends, the said supports being independent of each other, so as to permit an adjustment of the flexible seat to increase or diminish the slack of the seat; and I also expressed the opinion that it was immaterial what means were employed to make the flexible seat adjustable, to give it a greater or less tension, it only being essential, to my understanding of the second claim of the Shire patent, that the flexible seat ball be adjustable between its points of support, so that a greater or less slack or depression may be given to the flexible seat between its two points of support, and which peculiarity of adjustment makes the seat a "hammock" seat and "the adjustable hammock seat J of the Shire patent."

In my original testimony I also found in each of the said four exhibits the flexible seat with supports at the front and rear
359 independent of each other and made extensible, whereby the slack extension of the flexible seat could be increased or diminished, and therefore clearly embodying the invention of the Veeder patent as particularly recited — the first claim thereof.

In the two exhibits, "American Ideal" Bicycle and "American Ideal" Tricycle, I found that the adjustment of the seat supports were combined with an adjusting bolt, whereby the said supports may be forced asunder or permitted to approach each other, as described in the said Veeder patent and made the subject of the second claim thereof.

In the said two exhibits, "American Champion" Bicycle and "American Light Champion" Bicycle, I found that the two independent springs which support the flexible seat at the front and rear were attached directly to the backbone of the machine, thereby embodying the invention of the Kirkpatrick patent as particularly recited in the first claim thereof. For the reasons which I have given *I* in my answers regarding the Shire, the Veeder, and the Kirkpatrick patents, wherein I have compared the same three patents with the prior patents referred to by defendant's experts, and which I found to in no way qualify either of the said Shire, Veeder, or Kirkpatrick patents, I do not find in either or all of the said prior patents anything to qualify my opinion that the said four exhibit machines fully and clearly embody the inventions of the said Shire, Veeder, and Kirkpatrick patents, as I have particularly stated in my original testimony.

Recess until 2 p. m.

Resumed.

Mr. Jeffery in his deposition fails to find the invention of the second claim of the Shire patent in either of the four before-
360 mentioned machine exhibits, first, because neither of the said machines have a strap and buckle by which the seats may be adjusted; but in this he is in error, for, as I have before stated, in my opinion the proper understanding of the said second claim does not limit it to any particular means for adjustment, the said second claim including, as I understand it any means for adjusting the tension or slack of the saddle, and such means each of the said exhibit machines clearly contains.

Any adjustment of the flexible seats in either of the said exhibit machines which reduces the tension or gives to the seat more slack necessarily lowers the position of the rider with relation to the cranks and driving wheel substantially as such adjustment accomplishes the same result in the Shire patent. Any adjustment of either of the seats in the said four exhibits which tends to reduce the slack of the seat necessarily raises the seat or position of the rider with relation to the drive-wheel or cranks substantially as does the corresponding adjustment of the seat in the Shire patent.

For the reason that Mr. Jeffery is wrong in his premises in comparing the said four exhibits with the Shire patent he is consequently wrong in his conclusions. Mr. Powers basing his comparison of the said four exhibit machines with the said Shire patent upon the same premises stated by Mr. Jeffery, his conclusions are the same and consequently erroneous.

Mr. Jeffery, in comparing the two exhibits, "American Champion" and the "American Light Champion," with the Veeder patent, omits to consider the fact that the first claim of the Veeder patent does not qualify the supporting springs by any particular means of at-
tachment, but understand them to be limited to the specific
361 means for attachment and adjustment, and concludes that because the springs are independently attached to the back-

bone they are not the supports or springs of the Veeder patent. In this conclusion Mr. Jeffery is, in my opinion, wholly wrong. The seats of the two exhibits are, as I have shown, attached to independent springs or supports at the front and rear, and adjustable, as I have also shown, and therefore clearly embody the entire invention recited in the first claim of Veeder patent.

The conveniences which Mr. Jeffery refers to for adjusting the seat supports as found in the said two exhibits is the result of the invention of Kirkpatrick as an improvement upon Veeder; but it makes the saddles of these two machines none the less the saddles of the Veeder patent.

Regarding the Exhibits Defendant's "Ideal" Bicycle and "Ideal" Tricycle, the only distinction which Mr. Jeffery makes, as I understand him, between the saddles of these last two exhibits and the Veeder patent is that the independent supports for the saddle are substantially inelastic. He practically admits that they have the same adjustability and also substantially the same means for adjustment and the same flexible seat of the Veeder patent.

It is true that the supports of the said two exhibits are not elastic to any appreciable extent, but they are supports for the seat in two parts and substantially the supports or parts of the Veeder patent as recited in the first claim, in my opinion.

The omission of the elasticity of the supports or constructing them so that they will not yield under the weight of the rider does not, in my opinion, make those supports different from what they would be if elastic. This difference, therefore, which Mr. Jeffery indicates I do not understand to be essential either to the
362 first or second claims of the Veeder patent, and that therefore the absence of the elasticity in the supports of the seat in the said two "Ideal" exhibits makes them none the less the invention of Veeder, as recited in the first and second claims of the Veeder patent.

Mr. Powers appears to reason from substantially the same standpoint as Mr. Jeffery, and therefore fails to find the invention of the Veeder patent in either of the said four exhibits. For the reasons which I have already given I do not agree with Mr. Powers in his conclusions.

In comparing the two exhibits, "American Champion" and "American Light Champion," with the Kirkpatrick patent Mr. Jeffery simply states that he does not find the invention of the first claim of the Kirkpatrick patent in either of the two exhibits. He says he does not "find any independent front spring in defendant's machines;" but Mr. Jeffery, when he was comparing said two exhibits with the Veeder patent, stated as follows, referring to the "American Champion" and "American Light Champion": "I find an end spring placed at the forward part of the backbone and another spring at the rear of the backbone. Both springs are separated and independently clamped to the rigid portions of the machine. * * * Their actions are independent." And in such statement Mr. Jeffery was correct, and from this fact I am of the opinion that a strict interpretation of Mr. Jeffery's answer to ques-

tion 49, making the comparison between the two "Champion" exhibits and the Kirkpatrick patent, conveys a wrong impression of Mr. Jeffery's opinion on this subject.

From the above quotation from Mr. Jeffery's answer he must and does necessarily find in the said two "Champion" exhibits the inventions recited in the first claim of the Kirkpatrick patent.

363 I do not understand that Mr. Powers differs from me in my conclusions regarding the Kirkpatrick patent, for he says he does not find the invention of the first claim of the Kirkpatrick patent in the said two exhibits, for the reason that he finds flexible seats supported on springs in the prior art, as particularly shown in the Bishop patent and the Exhibit "Bishop Model." I have already shown that the state of the art, as presented in this case by the defense, does not exhibit an anticipation or qualification of the first claim of the Kirkpatrick patent, as I understand it, Mr. Powers, therefore, being in error as to his understanding of the art. His correct conclusions necessarily agree with my own.

Q. 6. Please next consider the pedal patents—

Defendant's Exhibit Jackson 1876 Pedal Patent,
" " Harrison 1877 Handle "
" " Settle 1881 Pedal "

and compare the mechanisms shown and described in each of said exhibits, so far as they relate to velocipede pedals, with the mechanisms shown and described in Complainant's Exhibit Latta Patent, pointing out their similarities and differences, referring to model exhibits introduced in connection with said patents, and compare the views expressed by the defendant's experts in reference thereto with your views, and explain to the court whether the prior art, as expressed in the said defendant's exhibits, modify the views you have heretofore expressed with reference to what Latta actually invented, and whether said invention is still, in your opinion, found in the structures made by the defendants, comparing your views with reference thereto with the views expressed by the defendant's experts, giving your reasons for such opinions as you may express.

364 A. As stated in my original testimony, I understand the peculiar pedal of the Latta patent to consist of a rubber pedal bar having its bearing side constructed with a longitudinal groove, which forms two points of rest for the foot, one each side of said central groove and so that the foot will rest upon the opposite edges of the bearing side. This peculiar shape of the pedal bar is the subject of the second claim of the Latta patent. The third claim, as I understand it, includes the same bar, with the longitudinal groove on the bearing side, making two parallel bearing surfaces at the edges of the bar, combined with a supporting rod, longitudinally and centrally through the bar and so that the two bearing surfaces stand upon opposite sides of the said bar.

Referring to the Exhibit Jackson Patent, I find illustrated and described a pedal which consists of a frame hung upon an axis, the said frame carrying two bars upon opposite sides of the axis, and so that in driving the machine the foot rests upon both bars, but so that the pedal may be used either side up, according to which is

presented to the foot. This is the same class of pedal illustrated in the Latta patent.

In the Jackson patent the bearing or foot surface of the pedal bars is semicircular, and the foot of the rider necessarily rests on each bar centrally and in a radial line from the center of the semicircular surface of the bar longitudinally through each of the pedal bars. Two rods extend concentric with the respective bearing surfaces of the bars.

The bearing or working surface of the pedal bars of the Jackson patent have each but a single bearing for the foot; there is no flat surface upon which a groove could be made to produce two
365 bearing surfaces. This Jackson patent lacks the entire features of both the first and second claims of the Latta patent. The bearing of the foot on the bar of the Jackson patent is directly onto the bar instead of at each side of it, as in the Latta patent. The foot bearing on the bars of the Jackson patent is of the extent only of a single line, whereas in the Latta patent two flat surfaces at the respective edges of the bar are provided for the foot. For these reasons I find nothing in the Jackson patent to qualify either the first or second claims of the Latta patent.

Second, the Harrison patent: The pedal bar illustrated in this patent consists of a cylinder of India rubber, having a central hole through it to receive the rod to support it. The surface of this cylinder is constructed, fluted longitudinally—that is, has numerous narrow longitudinal grooves in its surface. These grooves present sharp edges between them.

Such a cylindrical pedal bar cannot present a bearing surface of any extent as a foot rest, as does the flat-sided bar of the Latta patent, and, because it is cylindrical, there can be no longitudinal groove forming two bearing surfaces at the respective edges of the bar corresponding to the two bearing surfaces of the Latta patent.

In the Harrison patent the bearing of the foot is necessarily directly in a radial line from the centre of the rod supporting the bar, and, subtantially as in the Jackson patent, the foot cannot act upon surfaces each side of a groove so as to compress the pedal bar each side the rod, as in the Latta patent. For these reasons I find nothing in the Harrison patent to in any manner qualify either the second or third claim of the Latta patent.

Third, the Settle patent: This patent shows a pedal bar
366 of substantially the same shape as the pedal bar of the Jackson patent. The surface of the bar presented to the foot in the Settle patent is simply a line across the bar and directly upon the bar. The foot, in a pedal like the Settle patent, can only bear upon a single point on each bar. There is nothing in the pedal bar of the Settle patent that corresponds to the two bearing surfaces with grooves between them, as required by the first and second claims of the Latta patent. For the reasons given I see no reason to change or qualify the opinion which I originally expressed, that the foot pedals of the two exhibits, "American Champion" and "American Light Champion," clearly embody the invention recited in the first, second, and third claims of the Latta patent.

For the reasons which I have given I do not agree with Mr. Jeffery in his opinion that the fluted bar of the Harrison patent is the bar described and claimed by Latta.

Mr. Jeffery says that the "pedal described by Settle and shown in figure 4 of his drawing has the pedal frame illustrated, the rubber pedal bar provided with one central longitudinal groove, and the two bearing surfaces on the opposite side of the groove identically as claimed in the Latta patent, claim two." From this statement it is evident to me that Mr. Jeffery misunderstands the pedal bar shown and described in the Settle patent.

The pedal bar of the Settle patent is thinner midway between its upper and lower side than it is on a diametrical line through the rod or spindles, and so that the non-bearing sides of the bars present an uneven surface, but the feet of the rider can never rest upon this surface, nor are the pedal bars of the Settle patent adapted to be arranged so that the feet could bear upon these surfaces; but
367 if such an arrangement could be made the bearing points for the foot would be directly over the two spindles, not upon the sides of the bar, each side of the supporting rod or spindle; therefore the pedal bar of the Settle patent, instead of being identically the bar claimed by Latta, as stated by Mr. Jeffery, the said patent of Settle is essentially different and, in my opinion, has no bearing whatever upon the claims of the Latta patent.

The Jackson patent showing substantially the same bar as the Settle patent, Mr. Jeffery is of opinion that he finds in the said Jackson patent the invention of the Latta patent, but for the reasons which I have already given, indicating Mr. Jeffery's erroneous conclusion in regard to the Settle patent, apply equally to his conclusions regarding the Jackson patent, and he is in like error in finding in the Harrison patent the pedal bar of the Latta patent.

Mr. Jeffery, in comparing defendant's bicycles with the Latta patent, says that he does not find in the pedals of said bicycles longitudinal grooves, as shown in the Latta patent.

The pedals of the two exhibits have and clearly show the flat-sided pedals with a longitudinal groove centrally through the flat foot-bearing surface, leaving the two edges of the said bearing sides for the foot to rest upon. It is true there are two very slight bars across the groove in the pedals of these machines, but these bars do not make that groove any less a groove or in any sense qualify the two bearings provided by the gro-ve.

Mr. Jeffery calls these surfaces "panels," but the difference which Mr. Jeffery finds between the pedals of the "Champion" machines and the Latta patent is too hypothetical to be worthy of consideration.

Adjourned to 10 a. m., October 6, 1887.

368 OCTOBER 6, 1887—10 a. m.

Resumed.

Present as before.

Mr. Powers, in his deposition regarding the Latta patent, presents

the same erroneous course of reasoning pursued by Mr. Jeffery, and arrives at the same conclusions—that the said "Champion" bicycle and "Light Champion" bicycle do not embody the invention of the Latta patent, but in this conclusion Mr. Powers is, in my opinion, mistaken.

I find nothing in the state of the art presented by Messrs. Jeffery and Powers or in their testimony bearing on the said Latta patent or upon the question of infringement thereon by the said "Champion" bicycle and "Light Champion" bicycle to in any way qualify or change the opinion I expressed regarding the said Latta patent and the embodiment of the invention thereof in the said two bicycles in my said original testimony.

Recess until 2 p. m.

Resumed.

Q. 7. Please take up the following bearing patents testified about by the defendant's expert, viz:

Defendant's Exhibit Smith 1869 Bearing Patent;
also " " Rees 1872 " "
" " " Vernon 1872 " "
" " " Allcott 1870 " "
" " " Bailley *et al.* 1866 Bearing Patent;
" " " Jewett 1868 " "
" " " Gardner Jan., 1871, " "
" " " White 1867 " "
" " " Perley 1863 " "
" " " Smith 1877 " "

also Defendant's Exhibit Mennons 1860 Bearing Patent,
369 and compare the mechanisms shown and described in each of defendant's exhibits with the mechanisms shown and described in Complainant's Exhibit Peters Patent, and especially made the subject-matter of the second claim thereof, pointing out their similarities and differences, at the same time comparing your opinions in reference to said similarities and differences with those expressed by the defendant's experts relating to the same patents, using in connection therewith the model exhibits introduced as illustrating said patents or either of them, giving your reasons for such opinions as you may express.

A. The invention of the Peters patent, as shown and described therein and particularly described in the fourth claim, as I have before stated, I understand to consist in an axle arm or spindle provided with a beveled shoulder at one end, with a like beveled shoulder at the opposite end, which said second shoulder is removable from the axle arm, the two beveled shoulders of the axle being oppositely inclined and having anti-friction rollers adapted to take a bearing on the said two shoulders of the axle, the box which surrounds the axle being constructed with inclined surfaces corresponding, to wit, in reverse of the two beveled shoulders on the axle, and whereby a practical bearing is produced between the box and axle through the roll working upon the said corresponding beveled surfaces. I say

that one of the beveled bearing surfaces of the axle must be removable for the reason that it is impossible to assemble the parts—that is, to place the wheel containing the axle box and the rollers upon the axle—without the removal of one of the beveled shoulders on the axle.

In the Peters patent the removable beveled shoulder is illustrated and described as a part of the nut on the end of the axle.

370 The result of the construction shown in figure 4 of the Peters patent is that the wheel receives no support directly from the axle to resist the end or horizontal thrust, such thrust being taken entirely by the rollers against the corresponding inclined bearing surfaces in the box and on the axle—that is to say, any strain or tendency brought upon the wheel tending to force it farther onto the axle will be resisted by the inner end of the roller resting against the inner inclined shoulder on the axle and the like inclined shoulder in the outer end of the box against the corresponding incline at the outer end of the rollers. If the thrust of the wheel be in the opposite direction or tending to force the wheel from the axle the resistance to such thrust of the wheel is resisted by the rollers against the beveled surface of the nut and the corresponding beveled surface or shoulder at the inner end of the box against the corresponding incline at the inner end of the roll. It will be seen on refernce to figure 4 that, owing to the peculiar arrangement of the inclined or beveled shoulder or bearings, whereby the rollers take the longitudinal thrust of the wheel, that it is the rollers which locate and hold the wheel upon the axle and that the wheel or the box of the wheel has no direct bearing either against the axle or against the nut on the axle to resist such thrust or to prevent the removal of the wheel from the axle. As I have before stated, I understand the invention recited in the second claim of the Peters patent to be for the structure as illustrated in figure 4 of the drawings of the patent.

Referring to the several prior patents mentioned in the question and referred to by the experts for the defendant as bearing upon the said Peters patent and as tending to qualify or anticipate the

371 same, I take up, first, the "Smith 1869 Bearing Patent," which exhibit is a reissue of the 1869 patent. The said Smith patent represents a common carriage axle arm, having a conical shoulder at its inner end with the usual nut at the outer end, and also a conical collar around the arm upon the inner side of the nut.

The box adapted to work upon the axles is represented as a common axle box adapted to fit the arm. At its two ends the box is inwardly beveled to form surfaces corresponding respectively to the conical shoulder at the inner end of the axle arm and the conical collar at the outer end of the axle arm.

Under this construction the conical collars or shoulders on the axle arm and the corresponding shaped ends of the box produce bearings which are known in mechanics as "male and female centers."

In an axle and box constructed in accordance with the Smith

patent the beveled surfaces of the box work in close contact with the corresponding conical or beveled surfaces on the axle, so that the wheel revolving actually rubs with frictional contact upon the conical shoulders of the axle.

In the Smith patent the entire thrust of the wheel is resisted by direct contact of the axle with the box, the shoulder at the inner end of the axle holds and resists against the box in one direction, and the nut at the other end of the axle holds and resists against the box in the opposite direction.

In the Smith patent there are no interposed anti-friction devices between the axle and the box. The Smith patent, therefore, as I understand it, does not embody the invention as recited in the second claim of the Peters patent or have any bearing thereon tending to qualify the invention recited in that claim.

372 Second, the Rees 1872 bearing patent: This patent illustrates a wheel and axle substantially the same as that exhibited in the said Smith patent, except that it represents the device as applied to a stationary axle instead of a carriage axle, so far as the question of the Peters patent is concerned. What I have said regarding the Smith patent applies to the said Rees patent.

Third, the Vernon 1872 bearing patent: This patent illustrates and describes substantially the same bearing for wheel and axle as that illustrated and described in the said Rees patent, so far as the Peters patent is concerned. The wheel and axle of the Vernon patent are identically the same as the wheel and axle of the Rees patent, and consequently does not, in my opinion, anticipate or qualify the invention recited in the second claim of the Peters patent.

Fourth, the Allcott 1870 bearing patent: In this patent I find illustrated and described an anti-friction device between the wheel and axle of a carriage. The axle arm is constructed at its inner end with a permanent collar or flange, against which the box or hub must bear to resist the thrust upon the wheel, tending to force it onto the axle. At the other end of the axle arm is a nut screwed up against the outer end of the box or hub to hold the wheel upon the axle and resist the thrust which would otherwise tend to force the wheel off from the axle. This construction and arrangement of the stationary collar at the inner end of the axle arm and the nut at the outer end of the axle arm with the box between is substantially the same as in the most common construction of carriages. As illustrated and described in the said patent, the axle arm is cylindrical and of less diameter than the internal diameter
373 of the box, so as to form a concentric space between the box and axle arm. Into the space within the box and around the axle a series of rollers are introduced of a diameter corresponding substantially to the distance between the box and the axle arm. At both ends of these rollers they are tapered or beveled into a short conical shape. The inner end of the axle arm and its junction with the collar an annular, conical, or beveled surface is formed, corresponding substantially to the beveled or conical inner ends of the rollers. The nut at the outer end of the axle arm is constructed

upon its inner surface with a conical concentric projection corresponding to the beveled outer ends of the rollers.

The drawings illustrate and the patent describes rollers of smaller diameter, alternating with the series of rollers which I have described. These smaller alternating or intermediate rollers are longer than the principal rollers and are made conical or pointed at both ends. On the inner face of the collar, upon the axle, and upon the corresponding inner face of the nut a concentric V-shaped groove is formed, corresponding to the pointed ends of the said longer intermediate and smaller rollers, and so that said pointed ends of the smaller rollers will rest in and be supported by the grooves in the collar and nut respectively. The object of the intermediate rollers thus supported by the collar and nut is, as I understand it, to aid in maintaining the parallelism of the principal rollers.

The structure of the Allcott patent differs from the structure shown in figure 4 of the Peters patent in the fact that the box which surrounds the rollers is of equal diameter throughout its inner surface and has no beveled bearing at its ends adapted to the correspondingly beveled ends of the rollers, as required in the said Peters
374 patent, and because of the absence of such beveled or conical bearings in the box of the Allcott patent the rolls of that patent can perform no part or office either in holding the wheel upon the axle or in resisting the thrust in either direction, as must be the case in a structure like figure 4 of the Peters patent.

The wheel in the Allcott patent is held upon the axle and resists the thrust in both directions in identically the same manner as in carriage wheels and axles of the most common construction, and in which the wheel works directly upon the axle without intervening rollers—that is to say, the wheel is held upon the axle and resists the thrust directly through the axle independent of its anti-friction rollers, whereas in the Peters patent, as I have before stated, the wheel is held upon the axle and resists the thrust through the intrumentality of the anti-friction rollers.

For the reason that I do not find in the Allcott patent the beveled bearings of figure 4 of the Peters patent or any equivalent therefor, whereby the same result may be obtained, I do not find the Allcott patent the invention described in the Peters patent, particularly that in the second claim thereof.

Fifth, the Bailey *et al.* 1866 bearing patent: In this patent I find an axle which is constructed with two annular shoulders presenting a concave or segment shape in longitudinal sections, and I find a box surrounding this axle, the internal diameter of which is considerably larger than the largest diameter of the axle, but connective therewith. The length of the box is greater than the distance between the said two annular shoulders on the axle. At each end the box is provided with a removable cap, the said caps
375 having a concentric opening through them of about the smaller diameter of the axle. These two caps are each constructed upon their inner faces with concentric flanges which extend into the respective ends of the box and around the axle. The faces of these flanges toward the axle are of a reverse segment shape cor-

responding to the segment or concave shape of the shoulders on the axle, and so that in longitudinal section the segment or curve of the flanges is a part of the same circle of the segment-shaped shoulders and as clearly seen in figure 7 of the drawing of the patent.

Between the two flanges on the respective heads of the boxes and the corresponding shoulders of the axle series of spherical rollers or balls are introduced, the diameters of which correspond to the diameter of the curves of the said shoulder on the axle and the flanges of the heads of the box, and so that the said rollers take their bearing upon the axle on the said curved shoulders and on the correspondingly curved surfaces of the said flanges, and so that as the box or axle are rotated the one upon the other the support for such revolution comes upon the said rollers, they serving as an anti-friction device between the axle and box.

The structure shown and described in the Bailley patent differs from that shown in figure 4 of the Peters patent, in that the box of the Bailley patent is necessarily made with both its ends removable instead of in a single piece, as in the Peters patent; and, further, that the bearing surfaces for the rollers are curved and not beveled or segment-shaped, as in the Peters patent; and, further, because in the Bailley patent there is no removable shoulder or nut on the axle, whereby the box and the rollers may be applied to or removed from the axle, as in the Peters patent.

The differences which I have pointed out between the
376 Bailley patent and the Peters patent, figure 4, are, in my opinion, essential and material, and that therefore the structure shown and described in the Bailley patent is an essentially different device or structure from that described in the Peters patent and recited in the second claim therefor.

Sixth, the White 1867 bearing patent: This patent illustrates a furniture casting which consists of two plates arranged parallel with each other and with a spindle extending from one plate concentrically through the other so as to form an axis upon which said second plate may rotate, the said second plate carrying a caster wheel. In the adjacent faces of the said two plates concentric grooves are formed, the grooves in each plate corresponding in shape to the circumference of spheres, a series of which are placed therein, and so that as the one plate revolves the said spheres working in the said grooves support the weight and serve as rollers between the two plates.

The White patent discloses nothing in common with Peters' patent, figure 4, further than that there is a provision therein intended to produce an anti-friction bearing between two surfaces.

I should here state that in a bearing employing spheres, as the anti-friction device, that if the grooves in which said spheres travel are of a shape corresponding to and so as to fit the said spheres that there must be a rubbing friction between the said spheres and grooves according to the extent of contact between the spheres and grooves. To illustrate: The minimum amount of friction produced in employing spherical anti-friction rollers is attained when the spheres make contact with flat surfaces only, because in such

case the working contact of the sphere or ball is simply a
377 circumferential line, and to whatever extent this contact between the working surfaces and the sphere is increased the sphere must rub on that increased surface.

Adjourned to 10 a. m., October 7, 1887.

OCTOBER 7, 1887—10 a. m.

Resumed.
Present as before.

Seventh, the Jewett 1868 bearing patent: This patent represents an anti-friction bearing for axles in which the anti-friction devices are two annular series of spherical rollers or balls between the box and axle. The axle is constructed with two annular concave grooves, the curve of the grooves corresponding to a segment or a portion of the circumference of the balls. The box is made of a length substantially corresponding to the distance from the center of the groove on the axle to the center of the other groove on the axle. In the two ends of the box grooves are formed which practically form a continuation of the curve in the groove in the axle—that is, the combined surface of the groove in the box and the groove in the axle correspond to a little more than one-half the circumference of the balls. Caps are secured to the ends of the box, and upon the inner face of each cap a concentric groove is formed which, with the grooves in the box and the grooves in the axle, form two annular chambers or recesses around the axle and which chambers in longitudinal section are substantially circular and in diameter correspond to the diameter of the series of spherical rollers or balls arranged in said grooves. The bearing between the axle and the box is taken by the said two series of spheres; then, as the axle revolves or the box revolves, as the case may be, the
378 rollers will revolve accordingly; but, as I have before described, the balls being in contact with the adjacent surface substantially around their whole circumference, it follows that there must be a very considerable amount of friction between the balls and the said adjacent surfaces.

The construction shown and described in the Jewett patent differs essentially from that shown in figure 4 of the Peters patent. It is true if the construction were possible as shown in figure 2 of the Jewett patent the rollers would hold the box on the axle and would take the thrust between the two in either direction. I say "if the construction like figure 2 of the Jewett patent were possible" for the reason that a construction shown in figure 2 is an impossible one, because the opening into the grooves in the box and axle when the caps are removed is considerably less than the diameters of the balls. One of the series of balls might be first introduced into one groove in the axle by sliding the box from that groove so far as to permit such introduction of the balls and then the box returned onto the balls, but this will leave the groove at the other end of the box in such relative position to the groove on the axle that the opening between the outer edge of the groove in the box and the

outer edge of the groove in the axle very much less in width than the diameter of the balls, so that the balls could not be introduced therein.

In the Peters patent the nut or one side of the groove on the axle is removable from the axle, which permits the practical assembling of the parts and also permits adjustment of the bearing shoulders, and the necessity of such removal of one of the shoulders on the axle is, as I understand it, essential to the structure shown in figure 4 of the Peters patent and to the invention recited in the
379 second claim thereof; the essential feature of the Peters patent is not found in the Jewett patent or any substantial equivalent therefor; no part of the axle which goes to make up the bearing for the anti-friction rollers in the Jewett patent is removable or adjustable. I do not, therefore, find in the said Jewett patent anything which qualifies or limits the invention described in the Peters patent and particularly recited in the second claim thereof.

Eighth, the Gardner January, 1871, bearing patent: This patent, like the White patent before referred to, is a caster in which a series of balls or spherical rollers are arranged between two plates; there is no substantial difference between the Gardner and White patents, except that in the Gardner patent the bearing surfaces between the two plates for the balls are flat instead of curved as in the White patent. For the same reason, therefore, that I found nothing in the White patent which, in my opinion, qualified the invention — figure 4 and the second claim of the Peters patent I find nothing in the Gardner patent to do so.

Ninth, the Perley 1863 bearing patent: I find in this patent illustrations and description of bearings for the shaft of propellers in steamboats; the boxes which support the shafts, one divided horizontally in the plane of the axis of the shaft, so that the under part being stationary the upper part forms a cap which will set over the shaft in the box and serve to hold the shaft in the bearing. To produce an anti-friction device between the shaft and its bearing the shaft is constructed at the bearing part with several annular grooves, each groove semicircular in longitudinal section. The box and cap are constructed upon their inner surface with annular
380 grooves corresponding to the grooves in the shaft, of substantially the same depth, but the grooves in the box and cap are represented as having a flat bottom with parallel sides; into the grooves between the shaft and box series of spherical rollers or balls are introduced which take the bearing of the shaft, and upon which the shaft revolves.

The anti-friction bearing illustrated in this Perley patent differs essentially from the anti-friction shown in figure 4 of the Peters patent; first, because the box of the Perley patent is of an entirely different character from that of the Peters patent, is necessarily divided in the longitudinal plane of the axis, whereas the box of figure 4 of the Peters patent is not and could not practically be a divided box; second, because no part of the shaft which forms the bearing contact for the rollers in the Perley patent is removable as required in the Peters patent, and, third, because if the end thrust is to be taken by the

anti-friction rollers in the bearing of the Perley patent that thrust would be brought against sharp angles in the box instead of on flat surfaces as in the Peters patent. The Perley patent recognizes apparently this last-mentioned difficulty by making a special provision against end thrust, which I do not deem it necessary in this connection to describe. Because, therefore, of the absence in this Perley patent of the essential features necessary to the invention shown in figure 4 and recited in the second claim of the Peters patent this Perley patent, in my opinion, contains nothing which qualifies the said invention of the Peters patent.

Tenth, the Smith 1877 bearing patent: The Smith patent shows substantially the same axle-bearing as that shown in the Jewett patent, to which I have before referred, differing only therefrom
381 in the fact that instead of making the two annular grooves directly in the axle itself its inner groove is formed in a concentric collar on the axle and the outer or second groove is formed in an annular collar which is removably secured to the axle; and with this further immaterial difference, that the annular grooves in the said axle collars are substantially semicircular and consequently deeper than in the Jewett patent. Like the Jewett patent, the box in the Smith patent is constructed with a cap at each end, the adjacent faces of the said caps and box making grooves corresponding to the grooves in the collars of the axle, and which grooves, with the grooves in the axle, are in circular shape in longitudinal section, corresponding to the spherical rollers. Because of this difference—that is, the removable collar on the axle—it is possible to assemble the parts in the Smith patent, thereby overcoming or avoiding the impossibility which I pointed out as existing in the Jewett patent.

The said Smith patent does not exhibit an axle having beveled opposing surfaces for a series of anti-friction rollers, one of which said opposing surfaces is removable from the axle, independent of the other opposing surface, but, on the contrary, the said Smith patent exhibits an axle in which the two opposing bearing surfaces of one of the series of rollers are in one and the same piece and removable bodily from the axle, but said opposing bearing surfaces have no movement or adjustment independent one of the other. For the same reason, therefore, that I found nothing in the Jewett patent which, in my opinion, qualifies or limits the invention of the Peters patent, shown in figure 4 and recited in the second claim thereof, I find nothing in the said Smith patent which has any bearing upon the said invention and second claim of the Peters patent, as I understand it.

382 Eleventh, the Mennons 1860 bearing patent: This patent shows a carriage axle box and two series of spherical rollers, substantially the same as the Jewett and Smith patents before referred to. Like the Smith patent, the axle is provided with two annular collars, each having an annular groove in the periphery. The box is provided with two concentric rings corresponding to the annular collars on the axle and so as to surround those collars. The said rings are each constructed with an annular groove upon

the inner surface corresponding to the annular groove in the said collars, the said two grooves presenting oppositely curved surfaces in longitudinal section. In the grooves between the said collars and rings series of spherical rollers or balls are introduced, as in the said Smith patent, which are intended to form anti-friction rollers between the wheel and axle.

Just how the inventor in this Mennons patent intended to assemble the parts or introduce the balls between the collars and rings does not appear, but it would be impossible to get the balls into the groove between the rings unless the rings were divided in a plane through the axis; but this is immaterial in the consideration of the Mennons patent and its relation to the inventions of the Peters patent.

The Mennons patent does not show two opposing bearing surfaces for one series of anti-friction rollers, one of which bearing surfaces is independent of the other and so that the one of said bearing surfaces may be removed from the axle while the other remains thereon, thus lacking the one essential feature of the Peters patent.

There are substantially the same essential differences between the anti-friction bearing of the said Mennons patent and the in-
383 vention shown in figure 4 and described in the second claim of the Peters patent that I have pointed out as existing between the said Smith 1877 patent and the said invention of the Peters patent, and for the same reason that I did not find the said invention of the Peters patent in the said Smith 1877 patent I do not find the said Mennons patent to contain the said invention of the Peters patent or any substantial equivalent therefor.

I do not find in either or all the prior patents referred to in the question anything to qualify the opinion which I originally expressed regarding the said invention of the Peters patent. These several prior patents have developed nothing with which I was not thoroughly familiar before testifying in this case.

In reading Mr. Jeffery's deposition on the part of the defendant regarding the Peters patent and the several prior patents referred to in the question I find that Mr. Jeffery does not define what he understands to be the invention of the Peters patent, which is particularly recited in the second claim thereof, but that he refers to the several prior patents, pointing out certain features in each which correspond, in his opinion, to certain features of figure 4 of the Peters patent; but I don't understand that Mr. Jeffery is of the opinion that he finds in either of the said prior patents a bearing having all the features necessary and essential to the structures shown in figure 4, made the subject of the second claim of the Peters patent; but in considering the Peters patent he imports into the construction of figure 4 elements of other figures made the subject of independent claims, which, in my opinion, having no bearing upon the structure of figure 4 and the claim based thereon. Mr. Jeffery, if I understand him correctly, finds the Allcott patent to more
384 nearly represent the invention of the second claim of the Peters patent than any other of the patents to which he refers; and to better illustrate the Allcot wheel and axle he intro-

duced a model which is marked "Defendant's Exhibit Allcott Bearing Patent." I have carefully examined this model and find that it is not a fair representation of the devices described in the Allcott patent. It is like the Allcott patent in having a beveled shoulder near the inner end of the axle, and is like the Allcott patent in having a nut at the other end of the axle presenting a beveled bearing surface opposite the beveled shoulder or surface near the inner end of the axle. It is like the Allcott patent in that the axle is provided with a stationary collar at its inner end against which the box bears, and also in that the nut is sufficiently large to form a bearing for the outer end of the axle box and so that the wheel containing the box will be held upon the axle between said collar and nut, the said collar and nut being the sole support for the wheel against thrusts. It is like the Allcott patent in that it contains a series of anti-friction cylindrical rollers, the ends of which are conical, and which said conical ends are adapted to bear upon the beveled surface on the axle at one end and the beveled surface on the axle at the opposite end. But it is unlike the Allcott patent in that a sleeve is placed around the axle at the inner end, the inner surface of the said sleeve concentric with the beveled shoulder on the axle, and the said surface oppositely inclined, and so that the inner conical ends of the anti-friction rollers are adapted to work between the beveled shoulder on the axle and the beveled surface of the sleeve; and it also differs in that a sleeve is placed upon the inner face of the nut, the inner surface of the sleeve
385 concentric with the beveled surface or shoulder on the nut, and between which beveled surface of the sleeve and the beveled surface of the nut the outer conical ends of the anti-friction rollers extend. In this exhibit model these sleeves enclose the respective ends of the rollers, as will be observed by removing the box or case.

The Allcott patent exhibits no such sleeves for enclosing the ends of the bearing rollers, but, on the contrary, the ends of the bearing rollers are not enclosed at their ends except by the box which surrounds them, and while in the Allcott patent the beveled ends of the rollers will work upon the beveled shoulders of the nut and axle there is nothing inside of the box which projects over those beveled ends or can in any way be brought to bear upon the beveled ends of the rollers.

This model omits entirely the intermediate rollers which are shown and described in the Allcott patent, of smaller diameter than and arranged between the bearing rollers. As I before stated, these intermediate rollers of the Allcott patent are longer than the bearing rollers and terminate at each end in conical points which extend into concentric V-shaped grooves formed in the faces of the collar and nut on the axle, the said grooves serving as guides for the support and control of the movement of said intermediate rollers, but the principal or bearing rollers do not extend into these grooves at either end. This model, therefore, I say is not a fair

representation of the structure shown and described in the Allcott patent.

Adjourned at 12.50 p. m. until 2 p. m.

Resumed at 2.20 p. m.

A second model has been introduced on the part of the defendant owing to discrepancies in the first model, "Exhibit Model
386 Allcott Bearing Patent," which are made to appear, as I understand it, in the deposition of Mr. Jeffery. This second model, however, was introduced in connection with the deposition of Mr. Powers and marked "Defendant's Exhibit Model Allcott Bearing Patent No. 2."

Regarding the model, "Exhibit Model Allcott Bearing Patent," to which I have referred, the box or case was, for reasons which appear in the cross-examination of Mr. Jeffery, made an independent exhibit and marked "Defendant's Exhibit Case Inquired of X Q. 150 to 156."

In examining the said model, "Exhibit Allcott Patent Model No. 2," I find it to more correctly represent the device illustrated in the Allcott patent, it differing only in the fact that whereas the patent represents the opposing faces of the nut and collar as each constructed with a concentric V-shaped groove, corresponding to and so as to support the intermediate rollers, the said groove being of the same shape as the pointed ends of the intermediate rollers, in the model there is a groove in the opposing faces of the collar and nut, but not of a shape corresponding to the pointed ends of the intermediate rollers, so that the grooves in this model do not serve as a support and guide for the intermediate rollers independent of the bearing rollers. In this model the bearing rollers, like the bearing rollers of the patent, are of a length corresponding to the extreme length of the box and to the distance between the face of the collar on the axle on one end and the face of the nut on the opposite end, and the said collar and nut are of a size to bear against the respective ends of the box, and so that by means of said collar and nut alone the hub is held upon the axle and the said collar and nut take the entire thrust of the wheel in either direction independent of the rollers.

387 Mr. Jeffery is in error regarding the Peters patent when he states that the "cage" shown in figure 2 is essential to the construction shown in figure 4, for the specification particularly describes with reference to the beveled surfaces shown in figure 4 that those bevels may be made "smooth, cogged, or notched," and the second claim particularly mentions the same fact; therefore I understand by this patent that if desirable the beveled surfaces may be notched or cogged, so as to mechanically hold the rollers with their axes parallel to the axis of the axle around which they revolve; but whether so "notched or cogged" or whether "smooth beveled" I do not understand to be material to the invention of the fourth claim. Certainly Mr. Jeffery is in error if he is to be understood

as importing into that claim a cage or any equivalent therefor as a necessary element in that claim.

I agree with Mr. Jeffery that prior to the Peters patent anti-frictional bearings employing rollers of various descriptions, cylindrical and spherical, were common and well known in the art, but that under no circumstances is the Peters patent to be understood as claiming broadly such an anti-friction bearing.

In pointing out the differences which exist between the Smith 1869 bearing patent, the Allcott patent, the Reese patent, the Vernon patent, the Bailley, Jewett, Gardner, Perley, Smith 1877, and the Mennons of 1860, and the invention described in the said Peters patent, illustrated in said figure 4 and recited in the second claim thereof, I think I have clearly indicated the errors made by Mr. Jeffery in considering those several prior patents, so far as he finds in those patents anything which tends to limit or qualify the said claim of the Peters patent. I do not, however, understand Mr. Jeffery anywhere to assert that he finds in either of the said
388 exhibit patents or the models which he has made a bearing such as is illustrated in figure 4 of the Peters patent, in which the wheel is held upon the axle through the instrumentality of beveled shoulders on the axle and case and intermediate anti-friction rollers, whereby the entire thrust is taken from the wheel to the shoulders on the axle through the said rollers and with one of those beveled shoulders or bearings on the axle removable therefrom, as in figure 4 and claim 2 of the Peters patent.

Mr. Powers, the second expert on the part of the defense, refers to the same prior patents as did Mr. Jeffery to find anticipation or qualification of the invention of the second claim of the Peters patent. Mr. Powers appears to leave out of consideration the essential features shown in figure 4 of the Peters patent, and necessarily included in the second claim thereof, whereby the beveled shoulders of the axle, through the anti-friction rollers and corresponding shoulders in the box, serve to hold the box on the axle and bring the entire thrust of the wheel through the rollers onto the respective beveled shoulders on the axle, and when one of the said shoulders on the axle is immovable therefrom choosing apparently to limit the invention to only a small part of the structure shown in figure 4, and to such parts which, when taken by themselves, may be found in some of the prior patents.

In discussing the prior art as exhibited in the prior patents before referred to he takes, first, the Allcott patent, and because he finds in that patent an axle having a beveled shoulder and a nut with a beveled surface upon its inner face similar to the same part shown in figure 4 of the Peters patent and excluding other features concludes that he finds no "material difference between the
389 Allcott and Peters devices, so far as the same is embodied in the said second claim of Peters," and that in his "judgment the Allcott bearing device is a full and complete anticipation of the Peters device in the second claim," he not considering the differences between the construction shown in figure 4 of the Peters patent and that shown in the Allcott patent as material. I have, I believe,

clearly pointed out that these differences are material and that these differences constitute useful and essential features in the structure of figure 4 of the Peters patent and made the subject of the second claim thereof.

Mr. Powers is led into the same errors of opinion expressed by Mr. Jeffery regarding this Allcott patent, because he evidently misunderstands the invention of Peters as exhibited in said figure 4 of the Peters patent, which is the structure particularly described and referred to in the said second claim.

Of the Smith patent of 1875 Mr. Powers is led into error by not recognizing the fact as material that there are no anti-friction devices in this patent, but that, on the contrary, the revolving bearing of the wheel is taken directly between the box and axle, and the wheel is held on the axle and the thrust taken solely between the box and the collar on the axle at one end and between the box and the nut at the other end, and he is led into the same error in considering both the Reese and the Vernon patents, which exhibit substantially the same devices as the Smith 1869.

Mr. Powers refers to the Gardner patent of January, 1871, with the simple statement that it shows "beveled surfaces against which anti-friction balls are adapted to move." This is the Gardner patent to which I have heretofore referred, and which simply
390 shows a caster having two plates with anti-friction rolls between them working upon flat surfaces. There is no axle nor anything analogous to an axle-bearing described or shown in said patent, nor do I understand that Mr. Powers finds in the said Gardner patent anything to materially qualify the invention of the second claim of the Peters patent.

Mr. Powers also refers to the Gardner April, 1871, bearing patent, which illustrates simply the anti-friction device of his January caster patent as the bearing for a vertical shaft; but, like the January patent, I understand Mr. Powers only refers to this not as being the Peters invention, but as an illustration of the application of spherical rollers working between flat surfaces.

Mr. Powers also refers to "Defendant's Exhibit Chinnock 1853 Bearing Patent." This patent illustrates a device for retaining the wheel upon the axle. The box fits the axle and revolves thereon in the usual manner. Near the forward end of the axle an annular groove is formed, and the box is provided with a corresponding annular groove upon its inside, so that the combined grooves of the axle and box form a channel in which a series of balls are arranged, and because the balls take partly in the axle and partly in the box they serve to interlock the box and the axle so as to prevent the accidental removal of the wheel. As this patent exhibits no beveled shoulders between the box and axle and no rollers interposed between the box and axle, and as no part of the axle is removable, it has not, in my opinion, any bearing upon or tendency to qualify the invention of the Peters patent, as stated by Mr. Powers to be his opinion.

Mr. Powers also refers to the Blanchard 1861 patent as showing

"the application of anti-friction rollers to a bearing in sub-
391 stantially the same manner as Peters shows them in figure 4 of his drawing except that the rollers are not beveled at the ends; neither is the bearing or box beveled." Inasmuch as these differences constitute material points in the Peters invention, and without which it could not by any possibility be considered to be the structure of figure 4 of the Peters patent, Mr Powers is evidenty mistaken in his conclusions in comparing the Peters and Blanchard patents.

Mr. Powers, in considering the Bailley 1866 bearing patent, finds in it a construction of axle which locates the rollers within the box and keeps the rollers in a working position, as do the beveled shoulders in Peters. This is undoubtedly a fact, as I have heretofore stated, but I do not understand Mr. Powers to assert that either of the bearing surfaces on the axle of this Bailley patent are removable, but that, on the contrary, he agrees with me that both shoulders are integral parts of the axle, and that the box is of a structure entirely different from that of Peters.

Referring to the Jewett patent, Mr. Powers finds in this patent a box, axle, and anti-friction rollers as "another of the numerous modifications of the parts in which the same elements are combined to effect the purpose and only varying in their form and mode of adaptation," but inasmuch as the form or construction and mode of adoption in figure 4 of the Peters patent are essentially different from that described and shown in the Jewett patent, and as that difference constitutes the essential features of the invention of the Peters patent, as shown in figure 4, Mr. Powers does not find the Peters invention in the Jewett patent.

Mr. Powers also refers to the Webster patent of 1861. This
392 patent illustrates a journal box for a horizontal shaft. The box is divided longitudinally and the shaft is provided with a collar or sleeve concentrically around it and which stands within the divided box, the said box and sleeve having a corresponding annular groove in their adjacent surfaces to receive a series of spherical rollers as anti-friction devices between the shaft and journal box. I understand Mr. Powers does not refer to this patent as embodying the invention of Peters, but only as showing an anti-friction roller bearing.

Mr. Powers refers to the Perley patent only as illustrating another modification of anti-friction bearing. The Perley patent is, so far as it is an anti-friction bearing, substantially the same as the Webster patent.

Mr. Powers refers to the White patent only as another modification of an anti-friction bearing and which is substantially the same as that in the Gardner caster patent.

Mr. Powers also refers to the Sheldon patent of 1872, which simply exhibits another modification or application of anti-friction rolls to a caster.

Mr. Powers does not, as I understand him, find in either or all the prior patents to which he refers a structure like that shown in figure 4 of the Peters patent and the subject of the second claim thereof,

but that, in view of the state of the art, Peters practically made no invention. I do not agree with Mr. Powers in his conclusions.

Adjourned at 4.30 p. m. until 10 a. m. October 8, 1887.

Resumed Saturday, October 8, 10 a. m.

Q. 8. Please take up the defendant's exhibits used as anticipatory of the Wallace patent by defendant's experts, viz:

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Defendant's Exhibit	Bates 1878	Bearing	Patent,
" "	Lewis 1879	"	"
Defendant's Exhibit	Salamon 1880	"	"
" "	Smith 1877	"	"
" "	Brown & Hughes 1880	"	"
" "	Monks 1880	"	"
" "	Jeffery 1883	"	"

and compare the mechanisms shown and described in each of said defendant's exhibits, as well as the model exhibits introduced by defendant in connection with said patents, with the mechanisms and devices shown and described in "Complainant's Exhibit Wallace Patent No. 1" and "Wallace Patent No. 2," and made the subject-matter of the claims in controversy therein, pointing out their similarities and differences, comparing your opinions in reference thereto with the opinions of defendant's experts, giving your reasons for such opinions as you may express.

A. In the Wallace patent No. 1, as I have before stated, the bearing consists of an axle and a surrounding box, the box being in one part or piece and constructed with an internal annular groove, presenting two oppositely-inclined surfaces, with a sleeve on the axle between the axle and box, said sleeve being in two parts, the division being circumferential, and the meeting ends of the two parts made of conical shape, thus forming an annular V-shaped groove around the axle within the box, the inclined sides of the groove thus formed on the axle being opposed to the respective sides of the groove in box, the box being free for longitudinal movement on the sleeve. In the grooves between the two-part sleeve and the one-part box a series of spherical rollers or balls are introduced, and so that the two sides of the groove in the box and the two sides of the groove

394 formed on the axle by the divided sleeve take bearings on the balls, and so that the sides of the groove on the axle, through the balls, are opposed to the corresponding sides of the groove in the box. Thus in the Wallace patent the balls serve alone to hold the box longitudinally on the axle, and also to take the entire thrust between the axle and the box, as in the Peters patent.

In the said Wallace patent No. 1 one part of the sleeve is made adjustable with relation to the other part of the sleeve, so that the groove around the axle may be contracted or expanded to adapt the bearing to the size of the balls or to accommodate the bearing to the natural wear of the balls. The sleeve is made so adjustable by a screw-thread at the outer end of the adjustable part, which screw-thread is adapted to engage a corresponding part which is se-

cured to the axle, and so that by means of said screw-thread the said adjustable part of the sleeve may be moved longitudinally on the axle independent of the box, there being nothing which is made fast to the axle which takes a bearing against the box to resist or prevent the longitudinal movement of the box.

I have said that I understand the second claim of the said Wallace patent No. 1 to be for the combination of the said one-part box, the axle, the two-part sleeve on the box, when the said one-part sleeve is made adjustable on the axle by a screw-thread, operating in connection with a screw-thread which is substantially made fast to the axle, the result of which combination is that the said two-part sleeve, through the balls, not only make the revolving contact between the axle and the box, but also take the entire thrust of the wheel in both directions, and that I understand the third claim to be for the same elements as the second claim, when one part
395 of said sleeve is held stationary between the wheel and axle, and the other part is made adjustable by a boss or its equivalent, which is so held by the axle that it must revolve with the axle, but yet permits the adjustment of the said part of the sleeve.

Referring now to the Bate patent mentioned in the question, several bearings for velocipedes are illustrated therein. Those represented in figures 19, 20, 20*a*, and 21 illustrate conical bearings between the box and axle, substantially such as shown in the Reese and Vernon patents to which I have before referred, and commonly known as conical or male and female center bearings, but showing no anti-friction rollers or equivalent devices.

Figure 18 of the Bate patent illustrates an anti-friction bearing which consists of a two-part sleeve on the axle, adjacent faces of the two parts forming a V-shaped annular groove around the axle, with a box concentrically surrounding the said two-part sleeve and having formed upon its inner surface an annular, substantially V-shaped groove, corresponding to the groove between the sleeves on the sides of the groove in the sleeve, present surfaces opposing the corresponding sides of the groove on the axle.

Into the grooves between the box and sleeve short rollers are introduced, the ends of the rollers contracted to the points. The contracted ends of the rollers take bearings on the respective sides of the grooves in the box and on the axle, and so that as the wheel revolves the rollers run in the said grooves to take the substantial bearing between the box and axle. The box and outer portion of the sleeve rest against the inner face of the head of the crank, so that both the box and the outer portion of the sleeve take a bearing against and are longitudinally supported by the said head of the crank.

396 Under the construction thus illustrated in figure 18 of the Bate patent, if the crank head be forced inward on the axle it must move both the box and the outer or adjustable part of the sleeve simultaneously and to the same extent, and because the box takes its bearing longitudinally against the head of the crank the said crank, which is made fast to the axle, must take the thrust be-

tween the box and axle independent of the rollers and as in the Allcott and other patents to which I have heretofore referred.

The structure, figure 18 of the Bate patent, differs essentially from the Wallace patent in the fact that the box is supported longitudinally and against thrust independent of the anti-friction rollers, whereas in the Wallace patent the box is held against thrust and upon the axle solely through the instrumentality of the rollers.

There is this further difference between the said structures of the Bate and Wallace patents: the rollers of the Bate patent are short cylindrical rollers with tapering ends, whereas in the Wallace patent the rollers are spheres or balls.

Regarding the adjustment of the one part of the sleeve in a bearing like the Wallace or like the Bate patent, when the adjustable part of the sleeve that is moved, say, to take up the wear of the balls, it is not only the one part of the sleeve that must be moved, but the box must also be moved longitudinally. The movement of the box, however, will be but substantially one-half the extent of the movement of the sleeve. Such an adjustment of the sleeve independent of the box is permissible in the Wallace patent because the box is held longitudinally solely by the rollers, whereas in the Bate patent both the box and the sleeve bear alike longi-
397 tudinally against the single instrumentality or surface through which the adjustment is made. Because of this like bearing longitudinally of the adjustable part of the sleeve and box in the Bate patent, those two parts must move longitudinally alike under any possible adjustment which can be made in a structure like figure 18 of the Bate patent; hence the Bate patent does not exhibit structure like that of the Wallace patent or by which adjustment may be made under the construction described in the Wallace patent and made the subject of the second and third claims thereof.

Second, the Lewis 1879 patent: Figures 1 and 4 of this patent illustrate substantially the conical or male and female center bearings like the Reese and the Vernon patents. In figure 3 a bearing is illustrated of this same conical or male and female center bearing between the box and axle, having anti-friction rollers combined therewith. On the axle there is a two-part sleeve, the said two parts being of conical shape and so as to form an annular groove around the axle. The outer part of the said sleeve is made longitudinally adjustable. The box around the conical surface of the said sleeves, the opening in the two sides of the box corresponding in shape to and so as to take a bearing upon the conical surface of the sleeve, and so that the said sleeves operate directly upon the box to locate it upon the axle and to take the thrust of the wheel in both directions, substantially the same as in the male and female center bearing illustrated in figure 1 of the same patent.

The interior of the box is recessed to form an annular groove in the box around the two-part sleeve and between the ends of the box which bear directly upon the respective parts of the sleeve. The bottom of this annular groove in the box presents a surface
398 the reverse of the inner ends of the parts of the sleeve which project into the groove of the box. Into the groove in the

box a series of rollers are introduced, the ends of which are tapered corresponding to the conical portions of the sleeve which stand within the box and so that as the axle revolves within the box the rollers will run in the groove of the box and upon the corresponding surfaces of the parts of the sleeve to relieve to some extent the friction between the box and sleeves.

This bearing of the Lewis patent differs essentially from the bearing of the Wallace patent, in that in the Wallace patent the beveled or conical surfaces of the parts of the sleeve have no direct bearing contact with the box, as in the Lewis patent; but, on the contrary, the box of the Wallace patent is supported longitudinally and again thrust solely through the spherical rollers, and which connection permits an adjustment of the sleeve in the Wallace patent irrespective of the box, whereas in the Lewis patent the adjustment of the sleeve can only be made with relation to the corresponding surface in the box. I therefore do not find in the said Lewis patent the construction, arrangement, or combination of parts shown and described in the Wallace patent and made the subject of the second and third claims thereof.

Third, the Smith 1877 patent: This patent shows an axle-bearing for carriage wheels which, so far as the consideration of the Wallace patent is concerned, consists of an axle having two annular grooves upon its surfaces, each groove being an integral structure and in no sense forming a two-part sleeve on the axle. The box, instead of being a single or one-part box, is made in three parts—
that is, two parts to each groove on the axle—but the said
399 parts of the box are in no sense adjustable with relation to each other. There is no provision whatever in either of the grooves on the axle to take up the wear which may occur upon the series of spherical rollers or balls arranged in each groove.

I have heretofore fully described the structure of this Smith patent in considering its bearing upon the Peters patent. It is therefore unnecessary for me now to go into the consideration of the detailed construction shown in this Smith patent. The said Smith patent does not show either the one-part bearing box or the two-part sleeve in the said Wallace patent, nor does it show, in my opinion, the adaptation for adjustment and wear described and shown in the Wallace patent or any equivalent therefor; nor does the said Smith patent, in my opinion, illustrate or describe anything to anticipate, limit, or qualify the invention shown and described in the said Wallace patent, as particularly recited in the second and third claims thereof.

Fourth, the Monks 1880 patent: This Monks patent describes in an extremely vague manner some kind of a ball bearing as the third part of the invention. It contains no illustration or anything to give a clear idea of what the particular invention of the said third part consisted in. It describes briefly two conical bushes which are screwed, the one onto the other, and apparently that the said two bushes, when screwed together, form a V-shaped groove, and that the lower part of the fork of the bicycle "forms a cap somewhat circular," and that this cap has some kind of a groove in it for

balls to work in; it also mentions that "the outer end of the bush is formed with a milled or ratchet head, and is prevented from turning around after adjustment by means of a ball fastened to a
400 plate." The description given in the specification is too vague to indicate with any degree of definiteness what the inventor intended to do or the construction he intended to produce. This provisional specification contains nothing, in my opinion, to anticipate, limit, or qualify the invention recited in the second or third claims of the said Wallace patent.

Adjourned at 12.55 until 2 p. m.

Resumed at 2 p. m.

Fifth, the Salamon 1880 patent: This Salamon patent illustrates an anti-friction bearing for velocipedes, which consists of two series of spherical rollers or balls, both arranged concentrically about the axle. The box is in a single piece, having within it a concentric bearing surface for each of the said series of balls, the construction of the box permitting the introduction of one series of balls into one end of the box, and the second series of balls into the opposite end of the box. The axle is screw-threaded and is provided with two independent sleeves, one of said sleeves adapted to be screwed onto the axle and enter one end of the box and within the circle of balls in that end of the box, and so that the series of balls in that end of the box take a bearing upon one side directly on the box and upon the opposing side directly upon the sleeve. At the other end of the box a second and like sleeve is screwed onto the axle into the said other end of the box and within the second series of balls at the said other end of the box, and so that the said second series of balls are brought to bear upon the said second sleeve and within the corresponding end of the box. In this Salamon patent, then, there is a single, undivided sleeve for each series of balls and not a "two-part sleeve," upon both parts of
401 which a single series of balls take a bearing, as required in the invention of the Wallace patent No. 1, as I understand it

Again, in the said Salamon patent the adjustment of each of the two sleeves is produced directly on the axle, and neither of the said two sleeves has any other support than that which is given directly from the axle, differing essentially, therefore, from the invention of the Wallace patent. Because of the differences which I have pointed out, I do not find in the said Salamon patent the invention illustrated and described in the said Wallace patent No. 1, as I understand it, and particularly recited in the second and third claims thereof.

Sixth, the Bown & Hughes 1880 patent: This patent illustrates a sleeve fitted upon the axle of a bicycle and having an annular groove around its outside, the sleeve being a single piece, so that the two sides of the groove in the sleeves have no possible adjustment with relation to each other. Surrounding this sleeve is a box made in two parts, the division between the parts being in a plane

at right angles to the axis, the said two parts being the one part constructed to form one side of the groove within the box, and the other part of the box provided with a collar within it which forms the opposite side of the groves within the box. Into the annular recess around the sleeve formed by the groove in the sleeve and the two parts of the box, as I have described, a series of spherical balls are introduced to form substantially the working contact between the box and sleeve, or sufficient contact, at least, to cause the balls to rotate as the axle revolves.

The device of the said Bown & Hughes patent (referring especially to figures 3 and 9) differs from the device of the Wallace patent, first, in that in the Wallace patent the box or two sides
402 of the groove which form the box are integral and one and the same piece, and what is called in the patent a "one-part bearing box," whereas in the Bown & Hughes patent the box is made in several parts and the two sides of the groove in the box are separate and detached parts; second, in the Wallace patent the sleeve on the axle is made in two parts, and one of the said parts is made independently adjustable with relation to the other part of the sleeve, whereas in the Bown & Hughes patent the sleeve is in a single piece, the two sides of the groove therein integral parts of the same sleeve, and so that no possible adjustment of the groove in the sleeve can be made.

These differences which I have just pointed out constitute essential features in the Wallace patent, as I understand it; and because of the absence in the said Bown & Hughes patent of the said essential features of the Wallace patent I do not find in the said Bown & Hughes patent the invention illustrated and described in said Wallace patent, and particularly recited in the second and third claims thereof, as I understand the said Wallace invention.

Referring now to the Wallace patent No. 2, I find in this patent illustrated and described a bearing for vehicles of the same character as that illustrated and described in the said Wallace patent No. 1, the said Wallace patent No. 2 being for certain improvements upon the invention of the said patent No. 1.

In this patent No. 2 there is a sleeve upon the axle, made in two parts, as in the said patent No. 1, the adjacent faces of the sleeves beveled or conical to form an annular V-shaped groove around the axle, as in patent No. 1. One part of the said sleeve in the patent No. 2 is held against longitudinal movement on the axle, as is
403 the one part of the sleeve in the patent No. 1. The second or other part of the sleeve in this patent No. 2 is longitudinally adjustable on the axle, as is the adjustable part of the sleeve in the patent No. 1; but whereas in the said patent No. 1 the device employed to prevent accidental disadjustment of the adjustable part of the sleeve is a set-screw through the sleeve onto the axle, in the said patent No. 2 a serrated or toothed collar is arranged concentric with the adjustable part of the sleeve, and a movable dog or stop is arranged upon the hub of the wheel adapted to engage the serrated edge of the said collar, and so as to prevent accidental rotation of the adjustable part of the sleeve, the said dog or stop

being adapted to be moved out of engagement with the said collar, and so that by rotating the said collar the screw-thread on the adjustable part of the sleeve will cause that part of the sleeve to move toward or from the stationary part, according to the direction of such rotation, and when the proper adjustment is attained the said stop or dog, being again set into connection with the serrated collar, presents the rotation of the said collar to produce disadjustment of its part of the sleeve.

In the said Wallace patent No. 2 the box has the same internal annular groove and the same series of spherical rollers or balls as in the said patent No. 1; but in this patent No. 2 the box, instead of being adapted to be bolted directly to the fork of a bicycle, as in patent No. 1, the box in the said patent No. 2 is made of spherical shape on its periphery, and the end of the fork is constructed or provided with a recess on one side concentric with the axle, and into which concentric recess the spherical-surfaced box sets, and so that the box in its surrounding shell or case may be permitted a self-adjustment independent of its case or shell.

404 The two special features which I have mentioned, to wit, the locking of the adjustable parts of the sleeve and the self-adjustment of the box, constitute the essential features of the second and third claims of the said Wallace patent No. 2, as I understand the said invention.

Referring now to the prior patents referred to by defendant's experts, first, the Bate patent does not show a construction or arrangement of the box which permits self-adjustment, nor is there in the Bate patent a screw-threaded sleeve or part of a sleeve having any means to interlock it to avoid its rotation.

The same may be said in regard to the Lewis patent, and the same regarding the Salamon patent and the Smith patent. The Monks 1880 patent intimates that whatever the structure may be a part of it is prevented from turning by means of a pawl and ratchet; but this description, indefinite and vague without illustration of any character, does not give a clear understanding of what the inventor intended. But this Monks patent has no intimation of the arrangement of the box in a surrounding case.

In the Bown & Hughes patent, as I have before stated, the box is in a single piece, and no part of it adjustable; consequently this has not and cannot employ the locking device for the sleeve found in the Wallace patent No. 2.

I take into consideration the fact that this Bown & Hughes patent shows one of the four parts that go to make up the box is adjustable longitudinally by means of a screw-thread, and that the periphery of a collar on the said part is serrated, and that a locking dog is arranged to engage the serrated edge of the said part; but this I do not understand to be the interlocking device of the Wallace patent No. 2, for the reason that I do not under-

405 stand that the second claim of the Wallace patent is to be understood broadly for a locking device itself which will prevent the rotation of something, but that it is limited to the combination of such a locking device with one part of a two-part

sleeve adjustable on the axle by the rotation of the said one part. I therefore do not understand that the said Bown & Hughes patent illustrates or describes or in any way limits or qualifies the invention of the Wallace patent No. 2 recited in the second and third claims thereof, as I understand it.

The Jeffery 1883 patent illustrates an axle-bearing for velocipedes which consists of a box with an annular series of balls between the box and axle. A groove is formed on the axle to receive the balls by means of a shoulder on the axle, and the hub of the crank having a tubular projection therefrom which sets onto the axle, and so that the inner end of the said projection from the crank forms one side of the groove and the shoulder on the axle forms the other side of the axle groove. The crank is made bodily adjustable longitudinally on the axle, and so that, by adjusting the crank, the width of the groove in the axle may be increased or diminished.

The adjustment is produced by a set-screw through the head of the crank into the end of the axle, and to so connect the axle and crank that the power applied to the crank may be communicated to the axle a transverse key is introduced to interlock the two. The mechanism for the adjustment of the groove in the axle of this Jeffery patent does not illustrate the locking or adjusting device of the said Wallace patent No. 2, and does not, therefore, in my opinion, contain the invention described in the said Wallace patent, and particularly recited in the second claim thereof.

Adjourned at 4.50 p. m. until Tuesday, October 11, 1887, at 10 a. m., by consent.

406 Resumed Tuesday, October 11, 1887, 10 a. m.

Referring to the testimony of Mr. Jeffery regarding Wallace patent No. 1, and in comparing the first claim of the Wallace patent with the patent of Bate, Mr. Jeffery is led into the error as to the capacity of adjustment illustrated in figure 18. He says that his device is "adapted for adjustment for wear and securement in position on the axle by a screw-thread at the outer end of one part of the sleeve." There is no such screw-thread represented or described with reference to figure 18, nor does the drawing illustrate any practical means of applying a screw-thread to one part of the sleeve.

As I have before stated, it does not appear from figure 18 that there can be any adjustment of the sleeve with relation to the box, and whatever adjustment there is intended to be produced in a construction like figure 18 it can only be made by moving the crank bodily on the axle. Mr. Jeffery, if I rightly understand him, admits finally that the representation in figure 18 is not constructed in such a way as to move the sleeves apart or enlarge the space for the rollers, but can only operate to move the sleeves together.

Mr. Jeffery correctly points out the fact that the rollers in the Bate patent are of a cylindrical character and not spherical, as in the Wallace patent.

Mr. Jeffery refers to figure 20 as illustrating a method of adjustment of the parts of the sleeve with relation to each other, but I understand that he agrees with me that this adjustment is adapted to the construction of figure 19 and not figure 18.

Mr. Jeffery, in referring to the Monks patent, assumes a construction which, in my opinion, is not warranted from the vague description given in the provisional specification of Monks.

407 Referring to the third claim of the Wallace patent No. 1, Mr. Jeffery states that he finds that invention in the Lewis patent; but this Lewis patent does not have any external screw-thread upon the sleeve or any corresponding part with which such screw-thread may engage. Again, in this Lewis patent, instead of the adjustment of this patent being made between the rollers and the parts of the sleeve, the bearing, as I have before described, is a conical bearing directly between the box and parts of the sleeve, substantially the same in figure 3 of the Lewis patent as in figure 1 of that patent. The interposition of the rollers in figure 3 does not change the character of the bearing between the box and parts of the sleeve.

Mr. Jeffery also finds an illustration of the third claim of the Wallace patent in the Monks patent. He evidently does this from the very vague description of the Monks patent, with the full knowledge of the art of the present day, but such understanding of the Monks patent, in view of the date and vague description, is, in my opinion, unwarranted.

Mr. Jeffery also finds in the Bate patent the invention of the third claim of the Wallace patent, as I understand it, but from the fact that the Bate patent does not, in my opinion, contain the invention of the second claim of the Wallace patent, it cannot contain the invention of the third claim of the Wallace patent, for the reason that the third claim includes as a part of it the invention of the second claim.

Mr. Jeffery introduces a model marked "Defendant's Exhibit Figure 20, Bate Patent." This model differs materially from figure 20 of the Bate patent.

First. That the principal sleeve is not internally screw-threaded onto the axle, but, on the contrary, is provided with a device

408 to positively prevent its rotation on the axle.

Second. The inner sleeve in this model is so short that the adjustable sleeve and nut do not expose the end of the principal sleeve through the nut, as in figure 20 of the patent.

Third. The boss is formed on the end of the crank, against which the adjusting nut bears, and so that the two sleeves are supported one against the hub and the other against the crank, while in figure 20 of the patent no such construction is shown.

I find attached to this exhibit a ring having a V-shaped annular groove upon its inner surface, but I do not find any reference in Mr. Jeffery's testimony to this ring. This ring fairly represents the box of figure 18 of the patent, but does not represent the box of figure 19 of the patent, which is the box to which the sleeves of figure 20 and of figure 20*a* are adapted. This ring, therefore, which is at-

tached to figure 20 does not, in my opinion, represent anything contemplated in figure 20.

Mr. Jeffery also introduces a model marked "Defendant's Exhibit Figure 20*a*."

Like the model figure 20, this model figure 20*a* has the principal sleeve arranged so as to slide upon the axle instead of being screwed thereon, as represented in figure 20*a*. and it also represents the nut and sleeve as adapted to come to a bearing between the hub and crank as the means for preventing the longitudinal movement of the principal sleeve. Again, the shape of the groove formed by the two parts of the sleeve differs from the groove formed in figure 20*a* in being adapted for special rollers instead of to form male centers, as in figure 20*a*.

Mr. Jeffery also introduces the model marked "Defend-
409 ant's Exhibit Figure 3, Lewis Bearing Patent," which is an essentially different structure from anything warranted by the Lewis patent: First, the screw which is introduced through the head of the crank to bear against the outer part of the sleeve is made to enter a recess in the end of the sleeve as a means to prevent the rotation of that part of the sleeve; second, without the presence of the box of figure 3 of the Lewis patent the model is an unfair representation of what is shown in that figure 3. In figure 3 the miner cone or sleeve commences its conical shape at the hub of the wheel, and is of a shape adapted to form a center bearing for the box. In this model the sleeve is cylindrical from the hub outward and the incline is very sharp compared with the incline or conical shapes of the Lewis patent, so that this model is misleading with reference to the Lewis patent; but it exhibits the impracticability of the adjustment of one part of the sleeve shown in the Lewis patent, for it will be observed that the adjusting screw bears upon the sleeve at one side of the axle only, thus permitting a tipping action of the sleeve upon the axle under such adjustment, which will produce an irregular bearing between the sleeve and box, which irregular or impractical adjustment cannot occur under an externally screw-threaded sleeve, as in the Wallace patent.

Mr. Jeffery, in referring to Wallace patent No. 2 and the invention recited in the second claim thereof, finds an anticipation thereof in the Monks patent, before referred to; but the description which he finds to bear upon this subject is so vague and indefinite as to permit of almost any interpretation when taken in connection with the state of the art at the present time. Mr. Jeffery is, in my opinion, in error, as I have before stated, in his understanding of this patent.

410 Mr. Jeffery also finds in Bown & Hughes an adjusting device, but he finds and points out the differences between the Bown & Hughes and the Wallace patent No. 2, and which are essential to the said second claim of the said Wallace patent No. 2. I do not, therefore, understand him to say that he does find the invention of Wallace in the said Bown & Hughes patent.

Regarding the third claim of the Wallace patent No. 2, Mr. Jeffery refers to the Salamon patent, not to find therein the free bearing

box and a shell case like that of said Wallace patent No. 2, but a bearing in which there is an India-rubber cushion introduced between the box and the case which supports it. This India rubber surrounding the box does not give to the box adjustment, but simply serves as a cushion upon which the box rests to avoid the jar incident to a more rigid bearing.

Mr. Powers, in his testimony regarding both the Wallace patent No. 1 and the Wallace patent No. 2 and the invention recited in the second and third claims of both said patents, refers to the same prior patents as did Mr. Jeffery, and, because of following Mr. Jeffery in ignoring essential features of the inventions of the said two patents, he finds the said inventions anticipated. In my opinion he is unwarranted in his conclusions.

Neither Mr. Jeffery nor Mr. Powers have referred to anything in the prior state of the art with which I was not familiar when I originally testified in this case, and I find nothing in their testimony or in the patents introduced to lead me to in any way qualify the opinions which I have heretofore expressed.

Q. 9. Please take up the following patents, viz:

Defendant's Exhibit Taylor English Patent No. 2548;
also " Hawksley " No. 2296,
and the Defendant's Exhibit Clark English Patent No. 1728,
411 which patents the defendant's experts referred to as containing some of the mechanisms shown and described and made the subject-matter of the claims in Complainant's Exhibit Whitehead Patent, and compare the mechanisms of said defendant's exhibits above named with the mechanisms shown and described and made the subject-matter of the claims in the Whitehead patent, pointing out their similarities and differences; also point out such errors you may find in the statements of the defendant's experts with reference thereto, giving your reasons for such opinions as you may express.

A. In my original testimony I stated that I understood the invention of the second claim of the said Whitehead patent to be for a velocipede adapted to be driven by the feet of the rider, having combined therein the mechanism commonly called "balanced gearing," and that the third claim, as I understood it, included the same as the second claim, with certain mechanism between the foot and said "balanced gearing" whereby the revolution of the foot cranks was communicated to the said balanced gearing. If the said second claim was to be understood as broadly for such "balanced gearing,' irrespective of the other elements which go to make up a velocipede, then any of the many known balanced gearings would have been an answer to that claim, because, as I then stated, such balanced gearing, broadly considered, was common.

Referring now to the patent of Taylor, I find several illustrations of balanced gearing applied as a means for communicating power to a portable steam-engine, but it exhibits only the combination of such balanced gearing with certain other devices which go to make up a portable steam-engine. It does not illustrate an apparatus which is adapted to be rode or driven as a velocipede, nor has it,

as I understand it, anything in common with the Whitehead
412 patent other than it possesses the single well-known element, a balanced gearing.

The patent of Hawksley very vaguely describes a traction engine in which there is some arrangement of this well-known balanced gearing, but no intimation of an apparatus embodying the essential features of the velocipede necessary to the claims of the Whitehead patent, as I understand it.

The Clark patent exhibits another modification of the balanced gearing in a traction engine, but has nothing in common with the Whitehead patent, as I understand it, other than the presence in it of the well-known balanced gearing.

Mr. Jeffery in his testimony refers to the said Taylor patent, Hawksley patent, and Clark patent and finds them to "describe and show the invention and exact combination of devices of the second and third claims of this Whitehead patent." Mr. Jeffery gives no reason for his conclusion, but he is in error in his conclusions for the reason that he evidently assumes the claim of the Whitehead patent to be broadly for a balanced gearing, whereas, as I have shown, the balanced gearing, broadly considered, is a very old device, and that the invention of Whitehead cannot be properly understood to be for such gearing, broadly considered, but must be understood to be; but the second claim must be understood to be for a velocipede as a whole, having combined therein a balanced gearing between the two wheels, and that the third claim must be understood to be for certain mechanism between the crank pedals and the said balanced gearing whereby the revolution of the foot cranks under the action of the rider is imparted to said balanced gearing.

Recess to 2 p. m.

413 Resumed.

In Mr. Powers' testimony I notice that he studiously avoids any comparison of the Whitehead patent with the prior patent referred to by Mr. Jeffery.

I find nothing in the several patents referred to by Mr. Jeffery with which I was not familiar when I gave my first testimony in this case, or anything in either of said patents or in the testimony of Messrs. Jeffery and Powers to change or qualify the opinions which I have heretofore expressed in answer to questions on the Whitehead patent.

I should have pointed out the difference between the combination of the balanced gearing in the machines shown in the Clark and Taylor patents and that shown in the Whitehead patent.

In the Whitehead patent the balanced gearing is applied directly to the axle of the driving wheels and so that the said balanced gear acts directly upon both wheels.

In the Clark and Taylor patents there is no connection between the balanced gearing and the axles. The balanced gearing is arranged upon a shaft independent of the axles of the driving wheels, and the power through the balanced gearing is communicated to

the driving wheels by means of gearing intermediate between the said balanced gear shaft and the said driving wheels. Such an arrangement of balanced gearing as that disclosed in either the Taylor or Clark patents could not practically be employed in a velocipede, and, if employed, only a very slow speed could be attained if any movement of the machine could be produced.

It is essential, as I understand it, that a velocipede shall be adapted to attaining such a speed under the action of the
414 foot pedals as will give some considerable degree of momentum to the machine. This could not be attained with a mechanism in a velocipede like that shown in the said Taylor and Clark patents. Not only is the minimum velocity which I described necessary in a velocipede, but in order to be a practicable, salable machine it must be adapted to a high velocity. Nothing indicated in the said Clark and Taylor patents as to the combination of the balanced gearing indicates a capacity for such essential high velocity.

Q. 10. Please next look at this patent marked "Defendant's Exhibit Illston 1879 Handle Bar Patent" and compare the mechanisms therein shown and described with the complainant's patent marked "Complainant's Exhibit Benham's Patent," pointing out their peculiarities and differences, and also refer to the opinions given by the defendant's experts, both with reference to the similarity of the mechanisms of the two patents and the similarity of or differences between the mechanisms found in the defendant's machines marked "American Champion" and "American Light Champion," so far as their handles and their attachment to the machines are concerned, and their similarity or differences as compared with the above-named patents, giving your reasons for such opinions as you may express.

A. In the Benham patent the head of the machine is constructed with a horizontal groove transversely across the forward side of the head, the width of this groove being equal to the diameter of the handle bar. The handle bar is a continuous bar from end to end and of cylindrical shape, which permits the bar to be made tubular and consequently tighter. To centrally locate the bar a radial projection is formed on the bar in a central position and a
415 corresponding recess is made in the groove with which the projection on the bar may engage and which both locates the bar in a central position and prevents its rotation. The grooved portion of the head extends to the right and left and at the extreme ends of said grooved portion it is screw-threaded concentric with the bar. Two sleeves are placed upon the bar so as to slide freely thereon, the said sleeves being internally screw-threaded, corresponding to the externally screw-threaded ends of the grooved portions of the head, and so that when the bar is set in place the said sleeves may be screwed onto the corresponding ends of the grooved portion and thereby prevent the bar from being pushed forward out of the groove.

In the Illston patent I find represented the head of a bicycle in which the handle bar is removable therefrom. The head is con-

structed with a groove transversely across it, but instead of being a horizontal groove open at the front the groove is represented as oblique and opening upward. The grooved portion of the head is screw-threaded at both ends, substantially as in the Benham patent. The groove, instead of being of a width corresponding to the diameter of the bar, is, as I understand it, narrower than the diameter of the bar. The central portion of the bar is flattened for a length corresponding to the length of the groove in the head, and on one edge of this flattened portion a longitudinal projection is formed, adapted to entirely fill the groove when the bar is set in place. At each end of the flattened, central portion of the bar a shoulder is formed by an enlargement of the bar, these enlargements tapering from the shoulders outward and so that the end shoulders, when the handle is set into the groove, will rest against the outer ends
416 of the grooved portions, thus locating the bar in the groove longitudinally by means of enlarged shoulders formed on the bar at each end of the flattened portion. To prevent the handle from being lifted out of the groove two sleeves are applied to the bar, one upon each side of the central portion, the sleeves being internally screw-threaded at their inner ends, corresponding to the screw-threads on the head. The interior of the sleeves is of a conical shape, corresponding to the conical or tapering surface of the bar, and so that when the bar is set into the groove the sleeves may be screwed onto the head, and thus prevent the bar from being lifted from the groove. The projection or the upper side of the bar fills the upper portion of the groove, so as to prevent a cavity in the upper side of the head, which would exist were the groove not filled by this projection. The handle bar of this Illston patent is therefore not, as I understand it, the continuous handle bar described in the Benham patent—that is, by continuous I understand a cylindrical bar, in contradistinction to a bar which is forged or wrought into irregular shape, as in the Illston patent. The structure in the Illston patent lacks the engaging device within the groove found in and necessary to the location of the bar in the Benham patent. Because the groove in the Benham patent is in a horizontal instead of substantially a vertical position, as shown in the Illston patent, the structure of the Benham patent avoids the necessity of the projection on the bar of the Illston patent to fill the groove.

In considering the Illston patent, Mr. Jeffery sees in the Illston patent the undivided bar of the Benham patent, but he overlooks the difference in the construction of the bar on the two patents, as also the difference in the means for locating the bar longi-
417 tudinally. He understands that the projection on the bar of the Illston patent corresponds to the *extent* of the Benham patent, which locates the bar. In this he is mistaken. It is not that projection which so locates the bar in the Illston patent, but is the shoulders, as I have stated. In the Illston patent the said shoulders locate the bar longitudinally, and the projection prevents its rotation, whereas in the Benham patent the one projection from the bar into a recess within the socket performs both these offices.

Mr. Powers makes the same errors in considering the Illston patent in connection with the Benham patent as did Mr. Jeffery.

Referring to the defendant's exhibits, defendant's machines referred to in the question, I have heretofore compared the said machines with the Benham patent and found the only differences to be, first, that instead of making the projection or detent on the bar and the corresponding recess in the groove, as in the Benham patent, this order is reversed in the defendant's machines, the projection being in the groove and the recess in the bar. It is the reversal of the order and nothing more. The same parts in both the Benham patent and exhibit machines perform the same office, to wit, they longitudinally locate the bar and prevent its rotation. I also considered that in defendant's machines the bars are arranged in the same horizontal groove as in the Benham patent.

I have also described the devices in the exhibit machines which hold the bars in their respective grooves as divided clamp rings or clips which embrace the end portions of the groove and the bar so as to clamp the bar into the groove, and recognized the difference between the clips of the said exhibits and of the sleeves in the Benham patent, but I did not understand that there was any
418 material difference between the clips in the defendant's machines and the sleeves of the Benham patent, but that one was a substantial mechanical equivalent for the other.

Both Mr. Jeffery and Mr. Powers, if I understand them correctly, are of the opinion that these differences between the defendant's machines and the devices of the Benham patent are so materially different as to constitute them different structures, but I cannot agree with them in their conclusions.

Cross-examination by C. K. OFFIELD, Esq.:

C. Q. 1. In the Shire patent do you find any suggestions or provisions as to the material of which the saddle is made?

A. No, sir; any further than is indicated by the the term "hammock" seat."

C. Q. 2. To get at your idea, so that the court may put a correct value upon your exposition of the Shire, Veeder, and Kirkpatrick saddle patents in suit, I will ask you if you have not experted these different patents upon the supposition that nothing appears in this record to limit in any manner the respective claims of each of said patents as you have discussed them in your present deposition.

A. I have distinctly said in regard to the three patents mentioned and the particular claims referred to by me that I found nothing herein presented as defense which, in my opinion, limited or qualified the inventions recited in the respective claims of said patents any further than I have pointed out in my deposition.

C. Q. 3. Do you find the adjustability of the saddle of the
419 Shire patent to be for any other purpose or effect than for the purpose of raising or lowering the seat of the rider.

A. I find it to be simply to increase or diminish the slack or tension of the saddle, the result of which is to raise or lower the position of the rider accordingly.

C. Q. 4. You find, don't you, that the only purpose stated in the patent of this adjustable hammock seat is that the seat may be brought into close proximity with the driving wheel, and its use will permit of a driving wheel of greater diameter?

A. The purpose or result of adjustment does that thing. If the slack be increased the position of the rider will be brought nearer the cranks, and *vice versa*, and the nearer the rider may be brought to the driving wheel the larger the wheel that can be used.

C. Q. 5. Question repeated and answer requested.

A. I have stated the purpose, as I understand the patent has stated it. I have not quoted from the patent, and this is what I intended and believed my answer indicates.

C. Q. 6. You find nothing in the Shire patent about taking up slack or regulating the tension of the seat, do you?

A. Yes, sir; I do. The drawing which is a part of the patent illustrates an adjustable hammock seat, as described, and there can be no adjustment of that seat other than that which increases or diminishes the slack, after the same manner as the slack of a common hammock is increased or diminished.

C. Q. 7. Do you find that the hammock seat J of the Shire patent is adjustably secured to the seat block H?

A. I find that it is rigidly "secured" thereto.

420 C. Q. 8. Then the fourth claim of the patent, which states that the hammock seat J is adjustably secured to the spring E and to the block H, is a mistake, isn't it?

A. I have not considered the fourth claim, but if you quote correctly and taken in connection the specification I should not understand that there was any adjustment or adjustable attachment at the rear end of the seat.

C. Q. 9. Now, don't you know that this Shire device is nothing more nor less than an old-fashioned sway-back velocipede contrivance, where the rider sat down between the wheels of the bicycle, and that the saddle of this second claim is nothing more than a necessary seating device arising out of the peculiar construction of the entire device, which necessitated a raising or lowering of the saddle to conform to the weight or leg length of every different individual who mounted it; and don't you know that it is simply bald nonsense to attempt to draw any comparison between this Shire device and any saddle structure of the modern bicycle, such as has been called to your attention?

A. I don't know what you mean by an "old-fashioned sway-back velocipede contrivance," but I do know that nothing which has been offered by the defendants in this case has presented anything but the most absurd and ridiculous defenses to the invention of the Shire patent, having, as I understand it, cited nothing that has the slightest bearing thereon, and by their testimony have endeavored to broaden the claim of the Shire patent into an interpretation which would eliminate from it its essential, novel, and useful features, and I am also aware that a seat for a velocipede of the better class which did not embody this adjustable hammock seat would not be con-

sidered practical, and that if there be nay "bald nonsense"
421 it is apparent in the attempt of the defendant in comparing the invention of the saddle patents in suit with the state of the art as they have presented it.

C. Q. 10. You will kindly permit the court, I presume, to pass on the question as to whether the absurdities as to these saddle affairs involves the defendant's position and yourself and your allied experts?

A. You asked a question and I answered it, and nothing more.

C. Q. 11. In your opinion you could mount this Shire saddle on one of the defendant's velocipedes and regulate the slack and tension by a strap and buckle, couldn't you?

A. I have no doubt but a saddle like the Shire patent might be applied to defendant's machines and adjusted as it is in the Shire patent.

C. Q. 12. In your opinion the slack and tension in a saddle as applied upon the defendant's bicycles can be practically regulated by a strap and buckle, can it not?

A. I am of the opinion that it might be constructed so as to be adjustable by a strap and buckle, but I have no doubt that the more modern mechanism for adjustment is the better one.

C. Q. 13. Hammock seats were old at the date of the Shire patent and were so recognized in the patent, were they not?

A. I am not aware of an adjustable hammock-seat saddle as existing in the art prior to the Shire patent, but I am aware that suspended flexible seats for saddles, broadly considered, were well known long prior to the invention of Shire, and I find nothing in the patent which indicates an existence of such an adjustable hammock seat within the knowledge of the inventor.

C. Q. 14. Then the new thing in Shire was the adjustable
422 hammock seat for the purposes described in the patent, was it?

A. The new thing, as I have stated it heretofore, which Shire did and which is made the subject of the second claim of his patent was to produce an adjustable hammock seat for velocipedes in contradistinction to an inadjustable flexible suspension seat.

C. Q. 15. In the Shire device to bring the rider in the closest proximity with the driving wheel you would let out the hammock seat until it rested entirely upon the seat block and fender, would you not?

A. I would let out the strap until the forward end of the seat was as low as the rider could sit. To explain what I mean, and practically repeat the answer to substantially the same question given me in the cross-examination of my original testimony, if the seat be drawn up to its utmost tension the rider may sit well back on the seat and at the greatest possible distance from the cranks of the driving wheel. Now, as the slack of the seat is increased the rider will be naturally forced forward on the seat from the broader, rear end toward the narrower, forward end; the shape of the rider's body necessarily produces this result.

If sufficient slack be put into the seat it would come to a bearing

somewhere on the machine or perch below, between the two points of attachment to the seat, but the rider will be constantly approaching the cranks of the driving wheel from the most strained condition of the seat to its most practical slack condition.

Adjourned at 4.50 p. m. to 10 a. m., October 12.

Resumed October 12, 10 a. m.

C. Q. 16. Is the spring portion of the saddle in the Veeder patent in suit one or two springs?

423 A. Two; one which acts at the front and the other at the rear, and are two springs, because they are made in two distinct parts.

C. Q. 17. The patent says that it is one spring made in two or more parts, does it not?

A. The claim mentioned the spring as being in two or more parts, but the specification describes the forward spring as a "spring plate" and calls D "the rear portion of the spring plate, or rather a second spring plate;" and again the specification, speaking of these two springs, says as follows: That they furnish "a very elastic seat owing to the springing qualities of the metallic plates 'B' and 'D' and the flexible material 'C.'" The back or rear spring is again spoken of as the "back spring plate, 'D.'"

C. Q. 18. The different parts of the under spring in the Veeder patent are adjusted and adapted one with the other and are adapted solely to act upon one with the other, are they not?

A. The rear spring is made adjustable with relation to the forward spring, and the only support for the seat is the one spring "B," at the forward end, and the second spring "D," at the rear end.

C. Q. 19. Do you find any provision in the Kirkpatrick patent which enables the bifurcated front spring of the saddle to be located in any other manner than upon each side of the head of the machine?

A. I do find that, as I understand it, the inventor contemplates a spring which does not so extend each side the head, for the reason that in the first claim he makes no reference to such an extension of the front spring, but in the second claim, which is the same as the

424 first claim, as I understand it, with the qualification that "one of said springs or spring connections being adapted to extend forward of the head of the bicycle." Inasmuch, then, as in the first claim the inventor omits this qualification and introduces it in the second claim as a qualification of the combination of the first claim, I understand the inventor in the first claim to have included or contemplated a construction not having such an extension of one of the springs. Again, in the specification the inventor first describes the construction without such extension and then describes a construction of the forward spring which will be "adapted to extend forward of the head 'B' and turn upward and backward to connect with the forward end of the seat 'C.'"

C. Q. 20. If you should place the two springs of the Kirkpatrick patent entirely under the saddle, so that the lower ends of the two

springs should meet and be held by the same clip, "F," to the backbone, would you still have the invention of Kirkpatrick's patent?

A. If I understand the question, you mean that if the lower ends of the springs were extended so as to meet on the backbone and then both secured by the same device. So understanding the question, I answer: If in so doing you retain the securement of the two springs directly to the backbone, so as to retain their independence and at the same time retain the adjustment, it would then be the invention of the Kirkpatrick patent, in my opinion. If it did not retain these features it would not be the Kirkpatrick patent, as I understand it.

C. Q. 21. Well, would it be Kirkpatrick's invention if both springs were advanced towards each other so as to be located entirely upon the saddle seat and then held to the backbone by the clip "F" of Kirkpatrick?

425 A. If I rightly understand you, this is simply a repetition of the last question, and I can simply repeat my last answer. If, however, you will exhibit to me a structure such as you suppose and it shall then appear that I have not rightly understood your question, I will cheerfully answer.

C. Q. 22. I exhibit to you the Kirkpatrick patent and ask you to suppose the changed location of the springs as described and then answer the question.

A. That is as I understood the question previously, and I again repeat the answer.

C. Q. 23. Do you mean to say that you, as an expert, can't answer the question any more fully or satisfactorily than you have, or do you mean that you don't want to answer it and therefore call for something that you know can't be produced in this examination?

A. Neither. I mean to say that if I have not fully and clearly answered your question, then you have in your mind a construction entirely different from that which your question would indicate. I am aware that it is very easy to state a supposed construction in a question, as you have done, and fail to give such an understanding of that construction that but one interpretation can be placed upon it; hence, in making my answer to such a supposed structure on your part, I have first given what I understand to be the construction you have supposed, and I believe have done so, so that the court will fully comprehend my meaning.

C. Q. 24. I supposed that both springs of the Kirkpatrick saddle should be advanced wholly under the Kirkpatrick saddle and held to the backbone solely by the clip "F." You, in your answer, ignore both of these facts and talk about something else, as I understand you. Now, I would like an answer to the question, if

426 you care to give it, whether the construction first indicated would contain the invention of the first claim of Kirkpatrick.

A. If I have not answered it, it is not because of lack of disposition so to do, and if you think I have not, it is evidently because of your vague statement, that the springs "should be advanced wholly under the Kirkpatrick saddle." Will you please explain what you mean

by this expression? I have given my understanding of the expression, and if I am not correct I don't know what you mean.

C. Q. 25. Is it possible to advance or place both of the springs of Kirkpatrick wholly under the saddle and still retain the invention of Kirkpatrick?

A. Certainly it is, and as an illustration of it I refer to Exhibit Defendant's Machine in this case and my testimony herein in comparing them with the Kirkpatrick patent.

C. Q. 26. Calling your attention to the Peters patent in suit, did you ever see or know of a bicycle having in it any such bearing device as shown by this Peters patent?—and don't go off and talk about balls, but confine yourself to something at least approximately like the devices shown in this Peters patent, having at least the rollers in this patent.

A. I have; and, as I have hereinbefore testified, I find in defendant's machine exhibits herein "a bicycle having in it * * * bearing devices" substantially as shown and described in this Peters patent, and this irrespective of the consideration of cylindrical or spherical rollers.

C. Q. 27. The defendant's machines in evidence are the nearest approach to anything you ever saw like any device you ever saw in the Peters patent?

A. I have seen other machines embodying the device of the Peters patent.

427 C. Q. 28. Did such machines embody any device of the Peters patent any more closely than you find in the defendant's machines?

A. Like defendant's machines, they embodied the entire invention of the Peters patent, so far as this controversy is concerned—that is, the entire device of the second claim, as I understand it, irrespective of the consideration of the shape of the rollers.

C. Q. 29. Will you please answer the question as to whether you have ever seen any machines that embody the invention of the second claim of Peters any more closely of completely than the defendant's machines in evidence?

A. As in both cases the machines embody the entire invention of the second claim of the Peters patent, as I understand it, they must be to that extent alike, and one contain the said invention no less than the other.

C. Q. 30. Well, will you answer it in this way: Whether you have ever seen any kind of vehicle that embodied the invention of the second claim of the Peters patent, except bicycles with bearings substantially like the defendant's machines in evidence?

A. I have never, to my knowledge, seen a vehicle other than velocipedes which embodied the inventions of the Peters patent, and (if you do not exclude the consideration of spherical or cylindrical rollers) in all the machines which I have examined the rollers were spherical.

C. Q. 31. Will you please now state exactly and precisely and point out by letter and figure in the Peters patent "the bearings" made part of the second claim.

A. In the illustration of the invention in figure 4, the subject of the second claim, but two letters of reference are used: the
428 one letter, "F," indicates the inner beveled shoulder or the axle; the other letter, "G," indicates the removable beveled shoulder at the outer end of the axle. The bearings, figure four, include a series of rollers surrounding the axle, adapted to bear upon the same beveled shoulders, and a box having beveled shoulders corresponding also to the ends of the rollers. These elements are what I understand to constitute the invention recited in the said second claim of the Peters patent.

C. Q. 32. By what authority, then, do you exclude the rollers as an element of the second claim of Peters, if you have intended so to do?

A. I have distinctly said in my last answer that they are included.

C. Q. 33. Under what construction do you find that the cage of the Peters patent may be dispensed with?

A. It may be omitted from any of the arrangements of rollers, provided, of course, that a sufficient number of rollers be introduced—that is to say, if the rollers are to be so few in number as not to fill the space, then, undoubtedly, the cage would be desirable or some equivalent for it, which equivalent is mentioned in the patent as constructing the beveled shoulders with notches should any device be desirable to perform the purpose of a cage.

C. Q. 34. Is there the slightest suggestion or intimation in the Peters patent that the cage may be dispensed with where the shoulders are simply beveled and not notched?

A. Certainly there is. The specification states, referring to figure 2: "'D' shows a section or segment of a beveled flange for holding rollers in place, and 'E' a section or segment of circular plate for the same." Again, in describing the beveled shoulders, the specification says: "Said bevels may be made smooth, cogged,
429 or notched;" and claim 2, in referring to the bearings and to the nut, says they may be "beveled or notched." I therefore understand that it is optional to notch the bevels or leave them smooth.

C. Q. 35. My question was a little broader than I intended. Is it not a fact that the Peters patent makes necessary the employment of some device for holding the rollers in place in case the shoulders are simply beveled, and do you find it stated anywhere in the patent or suggested that you can fill up the space with rollers and thus utilize any invention of the patent?

A. I do not find anything that makes such device imperative, so far as the invention of the second claim is concerned.

C. Q. 36. This filling up the space with rollers, and in this way eliminating the use of a cage or notches or flanges for holding the rollers in place, as provided for by Peters, is an invention of your own, and not suggested in any manner by the Peters patent, is it?

A. No invention of my own, for long prior to the Peters patent, and as will appear by exhibits in this case, it was common to substantially fill the space with free rollers and also to support them in

a cage; and inasmuch as the first and fourth claims of the Peters patent specifically recite retaining devices, and as the second claim and the specification makes the retaining device optional in the case of beveled shoulders, I think that the omission of the retaining device and the filling of the space with rollers is clearly indicated.

C. Q. 37. Please point out in the Peters patent your authority for the statement that all devices in that patent may be dispensed with for keeping the rollers apart by filling up the entire space with rollers.

430 A. I did not say there was any such statement in the patent. You asked me under what construction did I find that the cage of the Peters patent could be dispensed with, and I answered you, and I later stated my authority to be the fact that the entire filling of the space with rollers and the employment of a cage to support a less number of rollers were well known in the art at the time of the Peters patent, and I also pointed out wherein the Peters patent indicated that in the invention of figure 4 the supporting devices for the rollers could be omitted.

C. Q. 38. You find, do you not, that one of the principal elements of the invention of Peters is to avoid your suggestion of filling the space with rollers, and the object of Peters' invention is "to support and keep the rollers from running against one onother and thereby producing friction"?

A. I find that the specification describes devices which will accomplish this result, such devices being positively included in the first and fourth claims, but made optional in the invention illustrated in figure 4 and particularly recited in the second claim.

C. Q. 39. Do you mean by that that the second claim itself makes it optional whether or not you should fill the entire space with rollers or use some means suggested in the Peters patent for preventing frictional contact between the rollers?

A. I mean that I understand it would be the invention of the Peters patent the same whether some device was employed to support the rollers or whether they run in contact.

C. Q. 40. The second claim speaks of the shoulders being "beveled or notched, as shown in figure 4." Are the notches shown in figure 4?

431 A. You evidently misunderstand the words of the claim after the last comma, to wit, "as shown in figure 4." I understand by these words that the combination of that claim is to be as shown in figure 4. The shoulders in figure 4 are simply beveled and without notches.

C. Q. 41. Then the combination of the second claim is not shown in any other figure of the Peters patent except figure 4?

A. I think not fully, or certainly not as clearly as it is in figure 4.

C. Q. 42. As I remember, on your former examination you gave it as your opinion that the rollers did not bear with any perceptible effect upon the axle around which they revolve in the Peters patent. Is this still your opinion?

A. I said then and it is my opinion still that the beveled shoulders of the Peters patent, under an adjustment such as is indicated in

the figure 4 of the Peters patent, would take the "substantial bearing."

C. Q. 43. That is your idea and entirely foreign to the invention of the patent, is it not?

A. No, sir; for at your suggestion in my former cross-examination, in answer to cross-question 64, I quoted from the specification my authority for this opinion.

C. Q. 44. Yes, and will you now quote from the specification of Peters, directly, such clause as shows the object of beveling the nut or beveling the inner ends of the rollers?

A. The only reference which is made as to an object for correspondingly beveling the ends of the rollers and nut and shoulder on the axle is, as I understand it, with reference to figure 5, in which the beveled shoulders on the axle and nut and bevel on the
432 rollers are said to retain the hub on the axle. In figure 4 or in any construction like figure 4 of the Peters patent the only resistance to end thrusts between the wheel and axle is taken through the rollers and the respective shoulders on the axle and box. The nut, therefore, must in this case hold the wheel upon the axle.

C. Q. 45. Do you not find it distinctly and clearly stated in the Peters patent that the object of the beveled nut conforming with the beveled ends of the rollers is for the purpose of retaining the wheel on the bearing of the axle, and that this is the sole purpose of the bevels, so far as stated in the patent?

A. The patent states, as you say and as I have said in my last answer, that the beveled nut may and does operate to hold the wheel upon the axle in figure 4.

C. Q. 46. Either you or I seem to have great difficulty in understanding a simple statement in the Peters patent. The Peters patent says, and this is all that it does say regarding the object of the bevel, does it not?—"To retain the wheel on the bearing of the axle, as the wheel of a common road vehicle, the ordinary nut in use for that purpose or its equivalent is made to bevel in conformity with the beveled ends of the rollers, and the bearing or axle at the inner ends of the rollers is made with a beveled shoulder to correspond with the ends of the rollers." Now, doesn't that quotation state all the objects of the bevels so far as disclosed by the Peters patent?

A. I think you entirely misunderstand the quotation. I understand that quotation to mean that the bevel or shoulder at the outer end of the axle may be made as a part of the common nut of the carriage axle and so that the single nut may perform the
433 double office of forming a bearing for the outer end of the rollers and at the same time hold the wheel upon the axle, and I base this understanding on the fact that it cannot do the one without necessarily doing the other, and when he states that the ordinary nut is made to bevel to correspond with the beveled ends of the rollers, so as to hold the wheel upon the axle, it necessarily must form a bearing upon which the outer ends of those rollers will work and as seen in figure 4.

Q. 47. Where, in the Peters patent, do you find the slightest authority for your assertion that the beveled portions take substan-

tially the contact pressure in operation instead of the entire length of the roller on the axle?

A. In figure 4, and in the quotation made in my answer to cross-question 64, referring to the beveled shoulders of the box against which the specification says the rollers work, those rollers working against the beveled shoulders in the box in figure 4 must necessarily work against corresponding shoulders on the axle.

C. Q. 48. Do you find anything more than a single simple thought or idea as expressed by your conception of the invention of the second claim of Peters?

A. I find the invention as recited in the second claim of the Peters patent, when taken in connection with "figure 4," a part of the said specification, and particularly referred to in said second claim, gives such a sufficiently full, clear, and exact description of the said invention of Peters as will readily enable a person skilled in the art to embody that invention, and that the said invention, as I understand the illustration, specification, and second claim, is as I have, I believe, clearly pointed out.

Recess.

434 C. Q. 49. In your opinion, are tapered rollers, as bearing devices, the same as spherical balls?

A. They are not spherical balls, but they may perform under certain conditions substantially the same functions and perform substantially the same operations as spherical ball.

C. Q. 50. In the bearings of defendant's machines, in your opinion, which more nearly resembles the second claim of Peters—the bearings of the front or rear wheels or pedals?

A. If by resemblance you mean an embodiment of the invention of the second claim of the Peters patent, as I understand it, then, as I have testified, both bearings embody the Peters, which bearing illustrates two conical or beveled shoulders on the axle and a corresponding two-sided annular groove in the box; the sides of the groove being level, and a series of rollers in the said grooves in working contact with the four sides, then the forward wheel more strictly represents the precise structure of figure 4 in the Peters patent than does the rear axle.

C. Q. 51. If the bearings in the Peters patent were curved instead of beveled, each corresponding to fit and play upon each other, would this construction then contain the invention of the second claim?

A. I understand your question to mean that the ends of the rollers be hemispherical and the corresponding working surfaces in the wheel and axle be made in the reverse shape. Am I right?

C. Q. 52. Yes.

—. Then I answer yes, sir. But I should state that under such like shape of the ends of the rollers and their bearing surfaces there would be a rubbing friction, which is avoided by making the shoulders beveled or so as to present only line bearing for the spherical ends.

435 C. Q. 53. Which of the defendant's bearing exhibits, in your opinion, most closely approaches the second claim of the Peters?

A. As neither of them exhibits the invention of Peters, illustrated in figure 4 and recited in the second claim of his patent, I do not understand how there can be a question of nearness. All are bearings of some character and have some features in common with Peters, but neither of the exhibits illustrates or describes the invention of Peters, as I understand it.

C. Q. 54. And none of the defendant's bearing-patent exhibits, as I understand you, in any manner limit or suggest the invention of the second claim of Peters. Is this correct?

A. As for the reasons stated in my direct testimony, it is correct.

C. Q. 55. Are you quite certain you understand Defendant's Exhibit Allcott 1870 Bearing Patent?

A. I have studied that patent several times within the last six years and have testified upon it when as offered as a defense against the second claim of the Peters patent, and believe I am warranted in saying that I do understand the invention illustrated and described therein.

C. Q. 56. The statement of invention of the Peters patent applies exactly to the Allcott construction, does it not, as well as the Peters construction?

A. The statement of invention in the second claim of the Peters patent does not apply at all to the Allcott patent. The Allcott patent shows certain features in common with figure 4 in claim two of the Peters patent, but not all the featurs of that figure and claim, and which constitute the invention of Peters, as I understand it.

436 C. Q. 57. You can substitute figure 1 of the Allcott patent for figure 4 of the Peters patent and eliminate the letters from both figures and the second claim of Peters would be fully expressed by figure 1 of the Allcott patent, would it not?

A. No, sir; not in connection with the description, and for reasons which I have fully pointed out in comparing the Allcott patent with figure 4 of the Peters patent. I do not wish to be understood as saying that the words of a claim in a patent, taken by themselves and referring to figures, might not be used in the claim of another patent and in reference to a certain figure and indicate in that second patent an entirely different structure from what would be indicated in the first patent, but under the supposed condition the words of the second claim describe the invention of Peters, figure 4, as they would not describe the figure in the Allcott patent.

C. Q. 58. Do you find anything in the Peters patent which fixes or limit- the angle of bevel to be given the end bearings on the shoulder or roller?

A. No, sir; any further than the bevel of the rollers and of the bearings should be substantially the same so far as to beveling of rollers and shoulders is illustrated and described.

C. Q. 59. Are the ends of the rollers under all circumstances of the Peters patent to be beveled or notched?

A. To be beveled, or some substantial equivalent shape which adapts them to roll upon the shoulders of the axle.

C. Q. 60. Where — the substantial equivalent shape for this bevel in the rollers of figure 2 of this patent?

A. I made my answer, supposing your question to refer to the invention in controversy, to wit, the invention of the second
437 claim. The invention as a whole I do not understand to necessarily include beveled rollers or beveled shoulders, but, on the contrary, figure 2 illustrates rolls which are cylindrical throughout, with simply a reduction of diameter at the ends to form concentric gudgeons.

C. Q. 61. Do you understand that if the notches of the second claim are used there is necessarily any bevel?

A. Certainly, or some equivalent therefor to be notched, because the patent says, speaking of bevels, as I have before stated, that they may be "smooth, cogged, or notched."

C. Q. 62. You find that the Allcott patent provides that the rollers in that patent may be made of any number or size sufficient to nearly fill the space around the journal, do you not?

A. They certainly may do so if the intermediate rolls are omitted, understanding your question to mean that the supposed rolls are of equal diameter and are bearing rollers.

— Q. 63. Does figure 1 of the Allcott patent show more than one set or size of rolls?

A. That figure represents the extreme ends of the intermediate rollers, these ends being lettered I to indicate the intermediate rollers referred to in the specification by that letter.

C. Q. 64. In your opinion what is the difference between the second and third claim of Peters?

A. I have never considered the third claim of the Peters patent in connection with the second claim and do not feel prepared to give an opinion without an opportunity for proper consideration.

C. Q. 65. Is there any difference between the second and third claim of Peters?

438 A. I can only say that I have no doubt there is some difference, from the fact that both claims exist in one patent, but as to the precise difference I am not prepared to state.

C. Q. 66. You have testified that you understand thoroughly this Peters patent. Now state what difference, if any, there is between the second and third claims, if you know.

A. I have testified that I understand the invention of the Peters patent and as recited in the second claim thereof, but I do not hesitate to say that the third claim is not limited to the beveled bearings and nut and the rollers as is the second claim, but is a statement of a claim for the whole thing irrespective of any qualifications, whereas the invention of the second claim is limited, as I have before stated.

C. Q. 67. Does the third claim state or cover the invention in claim two of figure 4?

A. The invention of claim two might be included in the structure

covered by the third claim, so that the use of the invention of the third claim would properly be held as an infringement of the second claim, or it might not so include the invention of the second claim.

C. Q. 68. Do you find any intimation or suggestion in Peters that he contemplated using any other bearing devices except the elongated rollers shown and described in his patent?

A. I find no other rollers mentioned in the Peters patent other than those illustrated, which are several diameters in length.

C. Q. 69. Calling your attention to Wallace patent No. 1, do you find any statement of invention in that patent?

439 A. I do find four distinct statements of the invention, numbered respectively 1, 2, 3, and 4, each of which is to me a clear and distinct statement of invention described in the specification and illustrated in the drawings.

C. Q. 70. You mean by that answer the four claims of the patent, do you?

A. Certainly I do, for, as I understand it, the claims of a patent is that part of the patent in which the inventor is required to particularly state his invention. If you mean, as I judge by your last question you do, whether or not there is a preamble to the specification setting forth the nature and objects of the invention, which is sometimes introduced into a specification preliminary to the description of the invention, such indication of the nature and object of the invention in this Wallace patent No. 1 is found at the close of the specification preceding the claims, beginning at line 27 on the second page.

C. Q. 71. Have you found anything in any of the defendant's exhibits offered in evidence which, in your opinion, suggests or limits the alleged inventions represented by the claims you have handled of either Wallace patent No. 1 or Wallace patent No. 2?

A. I have distinctly stated in my direct testimony that I have not, and have given my reasons for my opinions.

C. Q. 72. And, in your opinion, the broadest possible construction can be given to the claims of these two Wallace patents, and they can be considered base or foundation claims, can they not?

A. I think I have clearly pointed out in my direct testimony the scope of these claims, as I understand them, but I do not understand what you mean by base or foundation claims. Certainly I

440 have not indicated that Wallace was a pioneer in the art of anti-friction bearings or that the bearings illustrated and described in the two patents as the subject of the said claims would not employ a prior invention.

C. Q. 73. When did you first see a device constructed like either Wallace patent No. 1 or Wallace patent No. 2, like the claims in question?

A. I don't recollect.

C. Q. 74. Since these suits were begun?

A. No, sir; before I knew of the existence of these suits.

C. Q. 75. In comparing the Defendant's Exhibit Bate Bearing Patent with Wallace patents what stress, if any, do you lay on the fact that the rollers of the Bate patent are short cylindrical rollers

with tapering ends, while the bearings of the Wallace patents are spherical balls?

A. That difference, in my opinion, is the difference between success and failure, for the reason that the rollers of the Bate patent are either too long or too short to be practicable—that is, if free anti-friction rollers are to employed they must be of a length which will not readily permit the rolls to lose their parallelism, or, if reduced in length below that point, a sphere is, in my opinion, the only practical shape. Hence I say that whereas the short rolls of Bate would, in my opinion, be a failure, spherical rollers, as in Wallace, are a success.

C. Q. 76. In your opinion can the invention of the second claim of Peters and the claims of the two Wallace patents in question be embodied in the same bicycle bearing?

A. Yes, sir; for, as I understand it, the Wallace patent No. 1 embodies the invention of Peters, and is an improvement
441 thereon, while the Wallace patent No. 2 embodies both the invention of Peters and of Wallace No. 1. The illustration or such embodiment of the three inventions in one structure is found in the Exhibits Defendant's Machines, as I have stated.

C. Q. 77. Are the rollers of the second claim of the Peters patent, in your opinion, any more practical or successful than the rollers of Bate in tricycles?

A. Certainly they are. The Bate, in my opinion, unquestionably embodies the invention of the Peters patent, but the length of the rollers in the Peters patent is such as to permit them to maintain their parallelism in their rotation about the axle.

Adjourned until 9 a. m., October 13, 1887.

Resumed October 13, 1887, at 9.10 a. m.

C. Q. 78. In view of the statement of invention of the Benham patent in suit, is it really your opinion that there is any patentable difference between the handle bar of Benham and the handle bar of Defendant's Exhibit Illston Patent?

A. There is a difference which has warranted the Patent Office in granting a patent, which difference I have pointed out and which difference evidently, in view of the patent, constituted patentability.

C. Q. 79. In your opinion is the invention of the Moran patent in suit anything more than the application of the old rubber handle for knives and screw-drivers applied to the velocipede handle?

A. It is a different shape of handle, the handle being of a shape to give a spherical or ball-like termination of a bicycle handle, which the shape of a common knife handle or screw-driver handle could not give.

442 C. Q. 80. Have you not seen the handles of screw-drivers of the substantial shape of the handle of the Moran patent in suit long prior to the date of that patent?

A. No, sir; not with the ball-like termination of the Moran patent.

C. Q. 81. Have you not seen them with as much ball-like termination as appears on the defendant's machines?

A. I think not.

C. Q. 82. What do you understand to be the rat-trap pedal mentioned in the statement of object of invention of the Latta patent in suit?

A. I do not understand the meaning of the word "rat-trap" as used in the preamble to the specification, but the object of the invention, so far as the pedal bars are concerned, is "to so construct the parts whereby the pedal bars are more elastic and yielding to the foot than those" known at the date of the Latta invention.

C. Q. 83. When you gave your testimony before relative to the Whitehead patent in suit were you familiar with the letters patent offered in evidence by the defendants as anticipating the claim of invention of that patent?

A. I was and had been familiar with those patents for some time prior thereto and before my knowledge of this suit.

C. Q. 84. Which of the letters patent in suit, in your opinion, is the most valuable for the purpose of embodying the same in bicycle or tricycle structures?

A. I have no opinion as to the value of any of the patents employed or embodied in bicycles or any foundation upon which to base an opinion on that subject.

443 C. Q. 85. And you, as a mechanical expert, have no opinion as to the comparative value of the Peters or Moran inventions when incorporated into bicycle structures?

A. Never having had my attention called to it or heard testimony which would indicate the value, I have no basis on which to form an opinion. I do not understand that as a mechanical expert in patent causes, where I am called upon to give my opinion upon the devices described in and scope of the claims of letters patent and upon questions of infringement, that this necessarily implies that without consideration or time for investigation I am able to determine the values of inventions, comparative or otherwise.

C. Q. 86. If you are unable to form even an opinion as to the relative standing and value of the several devices in a bicycle structure represented by the patents which you profess to understand thoroughly, how does it happen that you can state with such confidence that these devices are improvements over the state of the art as shown by the patented mechanisms described in defendant's various exhibits?

A. Because of having studied the several patents and inventions to prepare myself to testify thereon.

JOHN E. EARLE.

444 JOHN G. BUZZELL, being duly sworn, doth depose and say, in answer to interrogatories propounded to him by L. L. Coburn, Esq., counsel for the Pope Manufacturing Company, as follows, to wit:

Q. 1. What is your name, age, residence, and occupation?

A. John G. Buzzell; sixty years of age; Lynn, Massachusetts; machinist and machinery manufacturer.

Q. 2. How long have you lived in Lynn?

A. About eighteen years.

Q. 3. Did you know a Mr. Fuller, who lived in Lynn?

A. I did.

Q. 4. Did you make for him a set of wagon wheels with ball bearings?

A. I worked for Sylvester Breed at the time, and I made them while I was in his employment.

Q. 5. Please describe the construction of the bearing of those wheels and the manner in which they are held on the axle, and also how the axle was made in order to secure the wheels on the axle; and, if you made anything representing it, please produce it.

A. This is a model of the outside end of the axle and hub, made with a groove in the end of the axle so that when the cap is put on, the wheel cannot get off. The inside bearing had no groove in the axle, but came against a shoulder where the axle is enlarged, the same as any common axle.

Counsel for complainant offers in evidence the model produced by the witness and requests that the same be marked for identification "Complainant's Model Exhibit of Fuller Wagon Wheel."

445 Objected to as incompetent under the testimony of this witness.

Q. 6. State what this model was made to represent and under whose directions it was made; I mean the model just offered in evidence and just produced by you.

A. It was made to represent the Fuller wagon wheel, the wheels that I made for Fuller. It was made under my direction, at the request of Mr. Pope.

Q. 7. About when were those wheels made?

A. I think about sixteen years ago.

Q. 8. Please look at this model, "Defendant's Exhibit Model Ball Bearing Fuller Wagon, 1867, Alfred H. Wood, notary public," and state whether that is like or unlike the Fuller wagon wheel which you made for Fuller, as to the nut and washer or any of its parts, and if it is unlike it describe the difference.

A. There was no nut used to hold the wheel onto the axle. The balls are not held in this socket as mine were. The inside collar which holds the balls in was made to conform to the shape of the balls more like the model I made. The grooves in the end of the axle as represented in the one that I made, "Complainant's Model Exhibit of Fuller Wagon Wheel," do not appear in defendant's exhibit just shown me.

Cross-examination by C. K. OFFIELD, Esq.:

C. Q. 9. You are an old friend of the Pope Company or of its officers, are you not?

A. No more so than any people that I have done business with.

C. Q. 10. How long have you been connected with the Pope Company or done business with it?

446 A. I have never done any business with them except to sell them a patent before I made this model.

C. Q. 11. Did you make this model offered in evidence yourself, personally?

A. I did not. It was made by one of my workmen under my dictation.

C. Q. 12. Did the Pope Company tell your workman how to make it?

A. I don't know that they ever saw him.

C. Q. 13. When was this model made under your direction?

A. I think it was made the first of last week. I may be mistaken and it may have been made earlier than that; it must have been made the week before.

C. Q. 14. Did you give your directions for making this model solely and alone from your memory?

A. I did.

C. Q. 15. Did a gentleman by the name of Mr. Jeffery call upon you at Lynn, Massachusetts, the latter half of last year or the first of this year, in regard to your recollection of what work you did on the ball-bearing axle for Mr. Fuller a great many years ago?

A. I don't remember meeting a man in Lynn or having any conversation or anything of the kind about the ball bearings or the Fuller wheel.

C. Q. 16. Did you not state to that gentleman at that time and place that you could not recollect ever doing any such work for Mr. Fuller, and that you had no definite recollection, if you did do such work, how the ball bearings were constructed or arranged on the Fuller wagon?

A. In the first place, I have no recollection of meeting a
447 man or having any conversation whatever in Lynn. I never made any such statement to any man in Lynn or in any other place.

C. Q. 17. Where has been your exact place of business in Lynn during last year and this?

A. I don't do business in Lynn; I only live there. I haven't done any business in Lynn for seven years.

C. Q. 18. Where is your exact residence location in Lynn and where do you do business?

A. I live at 21 Rockaway street, in Lynn; my place of business is at 89 High street, Boston, Massachusetts.

C. Q. 19. How long have you known the Pope Company and the Popes, its officers?

A. I can't give any definite dates, but I should think about eight or nine years ago I made their acquaintance.

C. Q. 20. When did the Pope Company or its officers first call your attention to this matter concerning which you made this model?

A. I should think about three weeks ago.

C. Q. 21. How many of them have talked with you about it? and give their names.

A. Well, there was, perhaps, two or three in the office; I can't give the names of any of them except Mr. Pope. It was not Albert Pope, at any rate, but I think it was his cousin. He is the secretary of the company.

C. Q. 22. Did you make more than one model?

A. I did not.

C. Q. 23. Did you change this model any in the making?

A. I did not.

C. Q. 24. Were you shown any patent before making this model?

A. No; I was not.

J. G. BUZZELL.

448 *Certificate.*

I, Lewis G. Farmer, a notary public within and for the county of Suffolk, in the Commonwealth and district of Massachusetts, special examiner by consent of the parties in said causes, hereby certify that on the several days named in the depositions hereto annexed I was attended at Boston, in said county, by the counsel and witnesses aforesaid; that the said witnesses were duly sworn and examined, and the said depositions were reduced to writing and read to the witnesses and by them subscribed in my presence or under my direction, and that the exhibits referred to in said depositions were introduced in evidence in said causes during the taking of said depositions, and that said evidence was taken under and in pursuance of agreement between the respective counsel.

LEWIS G. FARMER,
Notary Public and Special Examiner.

[SEAL.]

449 POPE M'F'G CO. } *vs.* GORMULLY. }

"COMPLAINANT'S CONTRACT EXHIBIT No. 1." L. G. F., N. P.

This agreement, made this thirteenth day of June, 1883, by and between the Pope Manufacturing Company, a corporation established under the laws of Connecticut and having a place of business in Boston, Massachusetts, party of the first part, and R. Philip Gormully, of Chicago, Illinois, party of the second part, witnesseth:

That whereas letters patent of the United States, numbered and dated as indicated in the following list, were duly granted for the improvements and inventions therein set forth, and by certain good and valid assignments and grants the same are now owned and controlled by the party of the first part, viz:

Number.	Date.	Inventor.
59,915	20 November, 1866	P. Lallement.
69,403	1 October, 1867	J. G. Buzzell.
72,538	24 December, 1867	J. Raddin.
79,654	7 July, 1868	G. W., A. E., and F. Hanlon.
80,425	28 July, 1868	H. A. Reynolds.
84,163	17 November, 1868	E. K. W. Blake.
85,527	5 January, 1869	J. H. Irwin.
86,251	26 January, 1869	D. T. Robinson.
R. 3,297	9 February, 1869	G. W., A. E., and F. Hanlon.
86,834	9 February, 1869	W. Hanlon.
87,259	23 February, 1869	M. Howe *et al.*
87,713	9 March, 1869	L. W. Serrell.
87,999	16 March, 1869	C. Witty.
88,426	30 March, 1869	E. Whitehead.
88,507	30 March, 1869	T. R. Pickering.
90,470	25 May, 1869	L. H. Soule.
91,062	8 June, 1869	G. B. Ambler.
98,920	18 January, 1870	J. G. Buzzell.
110,057	13 December, 1870	H. A. Maltby.
123,571	13 February, 1872	H. A. Maltby.
194,980	11 September, 1877	E. Whitehead.
197,289	20 November, 1877	A. L. Peters *et al.*
R. 7,972	27 November, 1877	P. Lallement.
235,551	14 December, 1880	T. W. Moran.
243,346	21 June, 1881	J. B. Price.
245,377	9 August, 1881	H. B. Hicks.
245,542	9 August, 1881	T. W. Moran.
249,278	8 November, 1881	A. E. Wallace.
249,447	15 November, 1881	F. W. Bacon.
249,622	15 November, 1881	W. W. Stall and J. E. Howard.
250,289	29 November, 1881	H. T. Russell.
250,316	29 November, 1881	W. A. Whiting.
R. 9,963	6 December, 1881	J. Raddin.
250,917	13 December, 1881	H. B. Hicks.
250,980	13 December, 1881	H. T. Russell.
250,981	13 December, 1881	H. T. Russell.
250,982	13 December, 1881	H. T. Russell.
252,371	17 January, 1882	Peter Gray.
252,461	17 January, 1882	H. B. Hicks.
274,762	27 March, 1883	C. F. Handy *et al.*

And whereas said party of the second part is desirous of importing, manufacturing, and selling velocipedes of the specific varieties known as bicycles, embodying in their construction and modes of

operation certain of said improvements and inventions and of securing license and authority therefor under certain of said letters patent, and of entering upon and aiding to develop the velocipede
451 business:

Now, therefore, said parties have agreed to the following terms and conditions:

First. The party of the first part agrees to license and does hereby license the party of the second part, subject to the conditions and provisions herein named, to manufacture at the shop or factory of the party of the second part, in Chicago, in the State of Illinois, and in no other place or places, bicycles having metallic wheels without rubber or elastic tires and not constructed or adapted for the reception or use of rubber or elastic tires, having their largest wheels not exceeding forty-two inches in diameter, to a number not exceeding four hundred in all, and also bicycles having metallic wheels and rubber or elastic tires and having their largest wheels not exceeding forty-six inches in diameter to a number not exceeding one hundred in all, said bicycles to be only the finishing up and working off of the materials and stock on hand with said Gormully on the twelfth day of January, 1883, and no others, severally embodying the improvements set forth in those of said letters patent numbered 69403 and 80425 and 85527 and R. 3297 and 86251 and 86834 and 87713 and 87999 and 88507 and 91062 and 98920 and R. 7972 and 110,057 and 123,571 and 249,447 and 250,316 and R. 9963 and no others, so far as applicable within the conditions and restrictions herein contained, and to sell said bicycles to others to be used and to use the same within and throughout the United States and the territories thereof. This license is not transferable.

Said party of the second part may make ordinary repairs on any machines and may deal in "second-hand" ones on which royalties have ever been paid by others to the party of the first part
452 as a matter of course, but this is not to be understood or construed as a license to import, manufacture, buy, sell, or deal in bicycles or tricycles or the patented parts thereof otherwise than as herein expressly stipulated.

Second. The party of the second part hereby agrees to advertise that he is licensed by the Pope Manufacturing Company.

Third. The party of the second part agrees to keep at his said place of business full, true, and correct books of account, open at all reasonable times to the inspection of the party of the first part or its representatives, in which shall be entered and set down all bicycles manufactured or sold by the party of the second part, with the name or description and size, style, and manufacture thereof and the names and addresses of the parties to whom sold.

Fourth. The party of the second part agrees to make full and true returns in writing to the party of the first part on or before the tenth day of each calendar month in each year, beginning with the tenth day of July, A. D. 1883, of all bicycles (and whether any or not) manufactured and sold in the United States by the party of the second part during the preceding calendar month, with

the size, style, name, or description and make of the machine and the names and addresses of the purchasers, and also of such machines held in stock by the party of the second part at the end of the said preceding month, said returns to be made under oath whenever required by the party of the first part, and to pay the royalties or license fees as herein stipulated on or before the said tenth day of each of said months on all sales of the said preceding month.

453 Fifth. The party of the second part agrees to pay to the party of the first part the sum of ten dollars upon and for each and every bicycle, except as modified in section "ninth" hereof, manufactured and sold in the United States or exported therefrom as part license fees or part royalties under the several letters patent last above named and as part of the consideration for this agreement; and it is agreed that the party of the second part shall so pay to the party of the first part under this license and agreement all sums in full within nine months from date of this license.

Seventh. The party of the second part agrees that he will not import, manufacture, or sell, either directly or indirectly, any bicycle or tricycle or velocipede containing the inventions claimed in said letters patent or either of them other than according to the permissions, conditions, and description in paragraph numbered "first" of this agreement or as elsewhere agreed in writing with the party of the first part, nor in any manner, directly or indirectly, violate or infringe upon the letters patent herein referred to or either of them, nor dispute or contest the validity of the same or the title thereto of the party of the first part or its assigns, but will aid and morally assist said party of the first part in preventing infringements upon the same; and the party of the second part hereby expressly admits the validity of the several letters patent herein mentioned and each and every claim thereof and the title of the party of the first part thereto.

Eighth. The party of the second part agrees to mark or stamp in a legible and durable manner the word "patented" on each machine made or sold under this license, and also to attach thereto a list of patents to be furnished by the party of the first part.

454 Ninth. On the said bicycles having metallic wheels without rubber or elastic tires and not constructed or adapted for the reception or use of such tires as described the royalties are to be forty cents each bicycle, of sizes having larger wheel thirty-two inches or less in diameter, and one dollar each of larger sizes, but not exceeding forty-two inch; and on said bicycles having rubber or elastic tires and having their larger wheels not exceeding forty-six inches in diameter the royalty is to be eight dollars each bicycle; and said Gormully is not to sell any of said bicycles at prices less or discounts greater than those of the St. Nicholas Toy Co. or Western Toy Co. for bicycles of substantially the same sizes and grades, and if he makes them of better grade he is to increase the prices correspondingly. The said returns and payments first to be made are to include all bicycles made and sold by said Gormully hereto-

fore, and this license is not to be taken as in addition to the special permission heretofore granted, but is to supersede that and apply to the same bicycles.

Tenth. If and whenever the party of the second part shall fail to make returns or to make payments as herein provided or shall violate or fail to keep and perform the terms, conditions, promises, or agreements or either of them herein mentioned on his part to be kept and performed the party of the first part may withdraw and terminate this license and the agreements on its part mentioned to be kept and performed by notifying the party of the first part in writing that this license has been revoked; and the party of the second part may surrender this license at any time by written notice to that effect and the returning of this agreement to the party of the first part, but no such revocation or surrender shall release or discharge the party of the second part from any payment,
455 return, liability, or performance which may have accrued, become due, or arisen hereunder prior to or at the date of such revocation or surrender; and it is hereby agreed that if the said party of the second part shall continue after such notice or surrender to make, sell, or use any invention set forth and claimed in the letters patent aforesaid or any of them the said party of the first part shall have the right to treat him as a mere infringer; and the said party of the second part consents that in such case, upon any suit brought by the said party of the first part against the said party of the second part for an infringement of the said letters patent or any of them, an injunction may issue, without notice to the said party of the second part, restraining him from making, selling, or using the invention or inventions in said letters patent or any of them set forth. Unless sooner terminated, as provided in this section, this agreement shall continue in full force for nine months from the date hereof.

Witness our hands and seals the day and the year first above written.

THE POPE MANUFACTURING COMPANY,
By CHARLES E. PRATT, *Attorney.*
R. PHILIP GORMULLY.

THE POPE M'F'G CO. *vs.* GORMULLY. } Term No., 824.

"COMPLAINANT'S CONTRACT, EXHIBIT No. 2." L. G. F., N. P.

This agreement, made this thirteenth day of June, 1883, by and between the Pope Manufacturing Company, a corporation established under the laws of Connecticut and having a place of
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improvements and inventions therein set forth, and by certain good and valid assignments and grants the same are now owned and controlled by the party of the first part, viz:

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245,377	9 August, 1881	H. B. Hicks.
245,542	9 August, 1881	T. W. Moran.
249,278	8 November, 1881	A. E. Wallace.
249,477	15 November, 1881	F. W. Bacon.
249,622	15 November, 1881	W. W. Stale and J. E. Howard.
250,289	29 November, 1881	N. T. Russell.
250,316	29 November, 1881	W. A. Whitney.
R. 9,963	6 December, 1881	J. Raddin.
250,917	13 December, 1881	H. B. Hicks.
250,980	13 December, 1881	H. T. Russell.
250,981	13 December, 1881	H. T. Russell.
250,982	13 December, 1881	H. T. Russell.
252,371	17 January, 1882	Peter Gray.
252,461	17 January, 1882	H. B. Hicks.
274,762	27 March, 1883	C. F. Handy *et al.*

457 And whereas said party of the second part is desirous of manufacturing and selling velocipedes of the specific variety known as bicycles embodying in their construction and modes of operation certain of the said improvements and inventions, and of securing license and authority therefor under certain of said letters patent, and of entering upon and aiding to develop the velocipede business: Now, therefore, said parties have agreed to the following terms and conditions:

First. The party of the first part agrees to license and does hereby license the party of the second part, subject to the conditions and provisions herein named, to manufacture at the shop or factory of the party of the second part, in Chicago, in the State of Illinois, and in no other place or places, bicycles and tricycles and children's velocipedes having only wooden wheels and metallic tires and metallic wheels without rubber or elastic tires and not constructed or adapted for the reception or use of rubber or elastic tires, having their largest wheels not exceeding forty-six inches in diameter, and bicycles having metal-ic wheels and rubber tires with larger wheels thereof, not less than thirty-eight nor more than fifty inches in diameter, and of such construction and quality of material and finish as to be (and actually to be) sold in the market at a retail price not greater than eighty per cent. of the lowest list price of Standard Columbia bicycles of same or next nearest size nor less than one hundred and twenty per cent. of the highest retail list price of bicycles of same or nearest size (having rubber tires) sold by the St. Nicholas Toy Company or the Western Toy Company of said Chicago, and it is understood that this is not a license to make the same grade of bicycles as are now made by either of said companies and no
458 others severally embodying the improvements set forth in those of said letters patent numbered 69403 and 80425 and 85527 and R. 3297 and 86251 and 86834 and 87713 and 87999 and 88507 and 91062 and 98920 and R. 7972 and 110,057 and 123,571 and 249,447 and 250,316 and R. 9963 and no others, so far as applicable within the conditions and restrictions herein contained, and to sell said bicycles to others to be used and to use the same within and throughout the United States and territories thereof. This license is not transferable.

Said party of the second part may make ordinary repairs on any machines and may deal in "second-hand" ones on which royalties have ever been paid by others to the party of the first part as a matter of course, but this is not to be understood or construed as a license to import, manufacture, buy, sell, or deal in bicycles or tricycles or the patented parts thereof otherwise than as herein expressly stipulated.

Second. The party of the second part hereby agrees to maintain a suitable and permanent place of business in said Chicago, and to keep there on hand a stock of bicycles as above referred to, and to advertise and make known his business, and in other and all proper ways to promote and aid in building up the bicycling business and interests in the United States, and especially in medium-grade boys'

and youths' bicycles, and to advertise that he is licensed by the Pope Manufacturing Company.

Third. The party of the second part agrees to keep at his said place of business full, true, and correct books of account, open at all reasonable times to the inspection of the party of the first part or its representatives, in which shall be entered and set down all bicycles manufactured or sold by the party of the second part, with
459 the name or description of size, style, and manufacture thereof and the names and addresses of the parties to whom sold.

Fourth. The party of the second part agrees to make full and true returns in writing to the party of the first part on or before the tenth day of each calendar month in each year, beginning with the tenth day of July, A. D. 1883, of all bicycles (and whether any or not) *and* manufactured and sold in the United States by the party of the second part during the preceding calendar month, with the size, style, name, or description and make of the machine and the names and addresses of the purchasers, and also of such machines held in stock by the party of the second part at the end of the said preceding month, said returns to be made under oath whenever required by the party of the first part, and to pay the royalties or license fees as herein stipulated on or before the said tenth day of each of said months on all sales of the said preceding month.

Fifth. The party of the second part agrees to pay to the party of the first part the sum of ten dollars upon and for each and every bicycle, except as modified in section "ninth" hereof, *or* manufactured or sold in the United States or exported therefrom as part license fees or part royalties under the several letters patent last above named and as part of the consideration for this agreement; and it is agreed that the party of the second part shall so pay to the party of the first part under this license and agreement at least the sum of one thousand dollars within and for any consecutive twelve months during the continuance of this license.

Sixth. The party of the second part agrees to sell bicycles
460 and not to sell the same or any of them to any person or party, either directly or indirectly, except upon such terms and at such rates and prices as shall be satisfactory to the party of the first part and as shall first be submitted in writing to and approved by the party of the first part, such written submission of rates, terms, and prices, with the said approval, to be taken as and to form a part of this agreement; pay or allow freight, bonus, rebate allowance, or commission on sales or from prices, except as expressly agreed, as herein stipulated.

Seventh. The party of the second part agrees that he will not import, manufacture, or sell, either directly or indirectly, any bicycle or tricycle or velocipede embodying the inventions claimed in the aforesaid patents or either of them other than according to the permission, conditions, and description in paragraph numbered "first" of this agreement or as elsewhere agreed in writing with the party of the first part, nor in any manner, directly or indirectly, violate or infringe upon the letters patent herein referred to or either of them, nor dispute nor contest the validity of the same or the title

thereto of the party of the first part or its assigns, but will aid and morally assist said party of the first part in preventing infringements upon the same, and the party of the second part hereby expressly admits the validity of the several letters patent herein mentioned and each and every claim thereof and the title of the party of the first part thereto.

Eighth. The party of the second part agrees to mark or stamp, in a legible and durable manner, the word "patented" on each machine made or sold under this license, and also to attach thereto a list of patents, to be furnished by the party of the first part.

Ninth. It is agreed that upon bicycles having metallic
461 wheels without rubber or elastic tires and not adapted to receive such tires and thirty-eight, forty, and forty-two inches in diameter of the larger wheel, respectively, the royalty is to be one dollar a machine, and upon such bicycles of forty-four and forty-six inches in diameter of largest wheel the royalty is to be two dollars a machine, and that on the other bicycles herein mentioned having rubber or elastic tires or adapted to receive such tires the royalties shall be four dollars a machine on thirty-eight, forty, and forty-two inch sizes, and eight dollars a machine on forty-four and forty-six inch sizes, and ten dollars a machine on forty-eight and fifty inch sizes respectively; and also until it is otherwise agreed thereabout in writing by the parties hereto the said Gormully shall maintain the retail prices of said bicycles having or adapted for rubber or elastic tires at a schedule rate not greater than eighty per cent. of the present list prices of the Standard Columbia bicycles of the same or nearest sizes and styles of finish nor less than one hundred and twenty per cent. of the present retail list prices of the St. Nicholas Toy Company and the Western Toy Company or either of them on bicycles having rubber tires of same sizes, and that said Gormully is not to allow, either directly or indirectly, a greater discount or commission to the trade or to dealers or agents than twenty-five per cent. from said schedule of retail prices, dealers or agents to be actually doing business as such in bicycles or other velocipedes, except, that is, the licensees of the Pope Manufacturing Company duly licensed to sell bicycles or other velocipedes with rubber tires; said Gormully may sell at a discount not greater than thirty-five per cent. off from said schedule of retail prices while their licenses remain in full force.

462 And it is agreed that if said Gormully shall construct and sell such rubber-tired bicycles above described or any of them differently, in that, whilst they have rubber tires, they do not have or receive a "contractile ring of round rubber in a grooved ring" or substantially that, when there shall be a rebate of one dollar a machine from the royalties above named on such last-named bicycles.

And it is further agreed that said Gormully may sell the herein-described bicycles by him to be made outside the United States and for actual sale and use only in foreign parts without the herein-contained restrictions as to prices and discounts, and that upon satisfactory evidence to the Pope M'f'g Co. if the exportation of such

And whereas said party of the second part is desirous of making, using, and selling to others to be used bicycles embodying in their construction and modes of operation certain of the said inventions, and of securing license therefor under certain of said letters patent:

Now, therefore, in consideration of one dollar by the party of the second part to the party of the first part, the receipt whereof is hereby acknowledged, and in further consideration of the covenants, agreements, and stipulations hereinafter contained, said parties have consented and agreed as follows:

466 First. The party of the first part agrees to license, and does hereby license, the party of the second part, subject to the conditions and provisions herein named, to manufacture at the shop or factory of the party of the second part, in Chicago, in the State of Illinois, and in no other place or places, bicycles of fifty-two-inch size and upwards of such quality, construction, grade, and finish as to be sold in the market at retail prices not greater than eighty per cent. of the retail list prices of the Standard Columbia bicycles of same or nearest similar sizes and styles severally embodying the inventions set forth in those of the said letters patent numbered 84163 and 85527 and 86251 and R. 3297 and 86834 and 87259 and 87713 and 87999 and 88426 and 88507 and 90470 and 91062 and 98920 and 110,057 and 123,571 or either of them or either claim thereof and no others, so far as applicable within the conditions and restrictions herein contained, and to sell said bicycles to others to be used, and to use the same within and throughout the United States and the territories thereof. This license is not to be understood or construed as a license to import, manufacture, buy, sell, or deal in bicycles or tricycles or in pedals, saddles, springs, rims, bearings, or other patented parts thereof otherwise than as herein expressly stipulated. This license is not transferable, and is in addition to and not to modify or supersede previous ones except as herein expressed.

Second. The party of the second part hereby agrees to maintain a suitable place of business in said Chicago, and to keep there on hand a stock of bicycles as above referred to, and to promote and aid in extending the interest in bicycling and tricycling and the use of bicycles among those not already wheelmen, and to

467 advertise the business by occupying and paying for one-page space continuously during the term of this license in the monthly magazine published by the Wheelman Company of Boston, Massachusetts, and to a reasonable extent to other publications of general circulation, and to advertise that it is licensed by the Pope Manufacturing Company.

Third. The party of the second part agrees to keep at its place of business full, true, and correct books of account, open at all reasonable times to the party of the first part and to its delegate, in which shall be set down all bicycles made or sold by the party of second part, with the name or description, size, style, and number thereof and the names and addresses of the parties to whom sold.

Fourth. The party of the second part agrees to make full and true returns in writing to the party of the first part on or before the tenth

day of each calendar month in each year, beginning with the 10th day of January, A. D. 1885, of all bicycles (and whether any or not) made, used, or sold in the United States by the party of the second part during the preceding calendar month, with the size, style, number, name or description, and make of the said machines and the names and addresses of the purchasers, and also of such machines held in stock by the party of the second part at the end of the said preceding month, said returns to be made under oath whenever required by the party of the first part, and to pay the royalties or license fees as herein stipulated on or before the said tenth day of each of said months on all said bicycles used or sold by them or removed from their said factory or place of business in the preceding month.

Fifth. The party of the second part agrees to pay to the
468 party of the first part the sum of ten dollars upon and for each and every bicycle in whole or in part made by or for it at any time prior to the 1st day of April, A. D. 1886, or the termination of this license as part license fees or part royalties under said several letters patent or such or either claim thereof as may be used and as part of the consideration for this agreement; and it is agreed that the party of the second part shall so pay to the party of the first part, under this license and agreement, at least the sum of one thousand dollars within and for each and any consecutive twelve calendar months during the continuance of this license.

Sixth. The party of the second part agrees to sell said bicycles at retail and not to sell the same or any of them to any person or party, either directly or indirecly, except upon such terms and at such prices as shall be satisfactory to the party of the first part and as shall first be submitted to and approved by the said party of the first part, such written submission of rates, terms, and prices, with the said approval, to be taken as and to form a part of this agreement, and not to have or sell through any agent or agents in any other place than the said Chicago, nor pay or allow freight beyond the said Chicago, nor any bonus, rebate, allowance, or commission on sales or from prices except as expressly agreed in writing between the parties hereto.

Seventh. The party of the second part agrees to mark or stamp in a legible manner the word "patented" on each machine made or sold under this license, together with the date or dates of the patents under which each machine is made or sold, a list of such patents to be furnished by the party of the first part.

Eighth. The party of the second part hereby expressly admits the validity of the several letters patent hereinbefore men-
469 tioned and of each and every claim thereof and the title of the party of the first part thereto; and further admits specifically that the following inventions are embodied in the "Ideal" bicycle and the "Standard Columbia" bicycle and the "Expert Columbia" bicycle, as follows, to wit: (*a*) the invention claimed in the second clause of claim of said patent, R. 3297, in the saddles of said bicycles and their connection therewith; (*b*) the invention claimed in the third clause of claim of the last-named patent in the

cranks of said bicycles; (*c*) the invention claimed in the fourth clause of claim of said last-named patent in the backbones and rear forks of bicycles; (*d*) the invention claimed in the third clause of claim of said patent No. 85527 in the leg-guard of said bicycles; (*f*) the invention claimed in the second clause of claim of said patent 86834 in the brake mechanism of said bicycles and its connections; (*g*) the invention claimed in the third clause of claim of said patent 86834 in the steering head of the said bicycles and its connections; (*h*) the inventions claimed in the fifth clause of claim of said patent 87713 in the tires of the wheels of said bicycles; (*i*) the inventions claimed in the third clause of claim of said patent No. 88507 in the front forks of said Expert; (*j*) the inventions claimed in the fourth clause of claim of said last-named patent in the pedals of said bicycles; (*k*) the inventions claimed in the claim of letters patent No. 194,980 in the balance gear and its connections in the "Columbia" and "Victor" tricycles; (*l*) the invention claimed in the second clause of claim of said patent No. 197,289 is embodied in the ball bearings of said Expert bicycle and Victor tricycle and in "Æolus" ball pedals; and further admits that any machines or part of machines constructed in a substantially similar manner are or would be infringements of said claims re-
470 spectively; and these admissions are unqualified and may at any time hereafter be pleaded or proved in estoppel of the party of the second part.

Ninth. The party of the second part agrees that it will not import, manufacture, or sell, either directly or indirectly, any bicycle, tricycle, or other velocipede or the pedals, saddles, bearings, rims, or other patented parts or devices containing any of the inventions or claims in either of the hereinbefore-recited letters patent, nor make, use, or sell, directly or indirectly, either (*a*) backbones bifurcated for a rear wheel, or (*b*) balance gear allowing two wheels abreast, differing speeds on curves, or (*c*) bearings containing balls or rollers and laterally adjustable, or (*d*) brakes combined with the handle bars and front wheel, or (*e*) cranks adjustable to different lengths of throw, or (*f*) forks of tubular construction, or (*g*) mud-shield for steering wheels, constructed to turn with the wheel, or (*h*) pedals that are polygonal or offering two or more sides for the foot, or (*i*) round contractile rubber tires in grooved rims or rims containing or adapted for rubber or elastic tires, or (*j*) saddles adjustable fore and aft, or (*k*) saddles having a flexible seat and means of taking up the slack, or (*l*) steering heads, open or cylindrical, with stop for complete turning, or (*m*) leg-guards over front wheel, or (*n*) rims of wrought metal tubing and adapted to receive a tire, or (*o*) rims composed of sheet metal, with overlapping edges, or (*p*) wheels containing hollow metallic rim and rubber tires, or (*q*) steering spindle and fork inclined to each other at an angle, or (*r*) two speed or power gears, or (*s*) "Tangent" spokes or "Warwick" rims, or (*t*) any other device or invention secured by either of these patents, other than according to the permission, conditions, and description in paragraph numbered "first" in this agreement or as other-

wise agreed in writing with the party of the first part, nor
471 in any way, either directly or indirectly, dispute or contest the validity of the letters patent hereinbefore mentioned or either of them of the title thereto of the party of the first part, but will aid and morally assist the party of the first part in maintaining the public respect for and preventing infringements upon the same.

Tenth. If and whenever the party of the first part shall reduce the royalties on bicycles of similar size, construction, and grade to any other licensee the above-named royalties shall be reduced in like manner and proportion to the party of the second part, and the party of the first part will immediately notify the party of the second part of any such reduction of royalties.

The party of the second part may sell said herein-licensed bicycles to regular agents and dealers in the trade and doing business as such in any part of the United States at discounts from the said retail list prices not exceeding twenty-five per cent. in any case and to the smaller agents not exceeding fifteen per cent., it being understood and agreed that said discount of not exceeding twenty-five per cent. may be allowed only to *our* dealer in each or either of the following cities: New York, N. Y.; Philadelphia, Pennsylvania; Boston, Massachusetts; Baltimore, Maryland; St. Louis, Missouri; San Francisco, California; St. Paul, Minnesota, and one city in the Southern States and to two dealers in Chicago, Illinois. Said party of the second part also agrees to keep the retail list prices fixed and not to allow said licensed bicycles to be sold at retail at less than said retail prices, either by his own concern or by agents or dealers.

The party of the second part may sell the said licensed bicycles outside the United States for actual use in foreign parts without the herein-contained restrictions as to prices and discounts, and
472 upon satisfactory evidence of such export and foreign sale of said bicycles there shall be allowed a rebate or credit of one-half of said royalties thereon.

Eleventh. If and whenever the party of the second part shall fail to make returns or to make payments as herein provided, or shall violate or fail to keep and perform the terms, conditions, promises, or agreements or either of them herein mentioned on his part to be kept and performed, the party of the first part may withdraw and terminate this license and the agreements on its part mentioned to be kept and performed by notifying the party of the second part in writing that the license herein contained has been revoked, and the party of the first part may in like manner revoke this license whenever the reported sales by the party of the second part for any consecutive twelve calendar months shall be less than one hundred machines. The party of the second part may surrender the license herein contained at any time by written notice to that effect and the returning of this contract to the party of the first part; but no such revocation or surrender and no termination of this contract or any part of it shall release or discharge the party of the second part from any payment, return, liability, or performance which may have accrued, become due, or arisen hereunder prior to or at the date of such rev-

ocation or surrender or from the obligations, admissions, and agreements contained in the sections hereof numbered "sixth," "seventh," "eighth," "ninth," and "eleventh" *hereof*, which are a part of the consideration for the granting of the license herein and are irrevocable, except by written consent of the party of the first part; and it is agreed that at the termination of the license herein contained at any time by expiration, revocation,
473 or surrender the party of the second part shall pay the within-named royalty on all said herein-licensed machines or parts of machines, whether wholly finished or not, or purchased or on hand, or ordered by or for said party of the second part at the date of said termination, and that the party of the second part will not sell the same except by first paying the full amount of said royalty and by complying with all the terms and conditions of this contract; and, further, that if the party of the second party shall continue after such termination of license to make, sell, or use any machine or substantial part thereof containing either of the parts specifically referred to in section "ninth" hereof, or in any invention in any form set forth and claimed in the letters patent aforesaid or any of them, the said party of the first part shall have the right to treat the party of the second part either as a party to and in breach of this contract or as a mere infringer, and the said party of the second part consents that in such case, upon any suit brought by the said party of the first part against the said party of the second part in any court, either upon this contract or for an infringement of the said letters patent or any of them, an injunction may issue without notice to the said party of the second part restraining him from making, selling, or using the said part or devices or the invention or inventions in said letters patent or any of them set forth.

Witness our hands and seals the day and the year first above written.

THE POPE MANUFACTURING COMPANY.
R. PHILIP GORMULLY.
THE POPE M'F'G CO.,
By CHARLES E. PRATT, *Att'y.*

474 THE POPE M'F'G CO. *vs.* GORMULLY. } Term No., 824.

"COMPLAINANT'S MEMORANDUM AGREEMENT NO. 4." L. G. F., N. P.

Memorandum.

That it is agreed by and between the parties hereto, in consideration of mutual stipulations herein contained, as follows:

First. The Pope M'f'g Co. agrees to waive and does waive the stipulations contained in the previous contracts of license between the parties hereto relating to the bicycles as to prices and discounts on and after the first day of January, 1886, this waiver to take effect at the last-named date and not before.

Second. The said Gormully is not to pay nor the Pope M'f'g Co. to claim any royalties on sales and deliveries of machines made by the said Gormully after the first day of July, 1886, and made only under patents whose terms expire prior to the last-mentioned date, whether manufactured prior to that date or not.

Third. Said Gormully is to pay and the Pope M'f'g Co. to claim one-half only of the royalties now paid on the sales and deliveries of "Ideal" bicycles sold and delivered by the said Gormully after the first day of May, 1886, and prior to the said July.

Witness our hands and seals this 28th day of November, 1885.

R. P. GORMULLY.
THE POPE M'F'G CO.
ALBERT A. POPE, *Pres't.*

475 THE POPE M'F'G CO. *vs.* R. PHILIP GORMULLY. } No. 824.

"COMPLAINANT'S EXHIBIT GORMULLY'S PROPOSED NEW LICENSE."
L. G. F., Examiner.

This agreement, made this — day of ——, 188–, by and between the Pope Manufacturing Company, a corporation established under the laws of Connecticut and having a place of business in Boston, Massachusetts, party of the first part, and R. Philip Gormully, of ——, party of the second part, witnesseth:

That whereas letters patent of the United States, numbered and dated as in the following list, were duly granted for the inventions therein set forth, and by certain good and valid assignments the same are now owned by the party of the first part:

Number.	Date.	Inventor.
98,920	18 Jan., 1870	J. G. Buzzell.
101,205	9 March, 1870	A. Allcott.
110,057	13 Dec., 1870	H. A. Maltby.
123,571	13 Feb., 1872	H. A. Maltby.
194,980	11 Sept., 1877	E. Whitehead.
197,289	20 Nov., 1877	A. L., G. M., and O. E. Peters.
216,231	3 June, 1879	J. Shire.
235,551	14 Dec., 1880	T. W. Moran.
235,552	14 Dec., 1880	T. W. Moran.
239,629	5 April, 1881	C. H. Veeder.
240,905	3 May, 1881	J. Harrington.
243,346	21 June, 1881	J. B. Price.
244,693	19 July, 1881	C. H. Veeder.
245,377	9 Aug., 1881	H. B. Hicks.
245,542	9 Aug., 1881	G. W. Moran.
246,650	6 Sept., 1881	C. L. Work.

Number.	Date.	Inventor.
248,545	18 Oct., 1881	C. L. Work.
249,278	8 Nov., 1881	A. E. Wallace.
249,447	15 Nov., 1881	F. W. Bacon.
249,622	15 Nov., 1881	W. W. Stale and J. E. Howard.
250,289	29 Nov., 1881	W. T. Russell.
250,316	29 Nov., 1881	W. A. Whiting.
250,917	13 Dec., 1881	H. B. Hicks.
250,980	13 Dec., 1881	H. T. Russell.
250,981	13 Dec., 1881	H. T. Russell.
250,982	13 Dec., 1881	H. T. Russell.
252,280	10 Jan., 1882	C. H. Veeder.
252,371	17 Jan., 1882	Peter Gray.
242,461	17 Jan., 1882	H. B. Hicks.
257,375	2 May, 1882	A. H. Overman.
274,163	20 March, 1883	J. L. Wilson.
476		
274,762	27 March, 1883	C. F. Handy and W. P. Anthony.
277,870	22 May, 1883	W. P. Benham.
277,974	22 May, 1883	W. P. Anthony.
278,560	29 May, 1883	T. J. Kirkpatrick.
279,956	26 June, 1883	J. Knous.
280,421	3 July, 1883	Albert E. Wallace.
280,633	3 July, 1883	E. G. Latta.
281,889	24 July, 1883	John Knous.
282,938	7 Aug., 1883	C. H. Warner.
283,306	14 Aug., 1883	C. H. Warner.
284,782	11 Sept., 1883	A. E. Wallace.
286,476	9 Oct., 1883	W. Notley.
289,272	27 Nov., 1883	T. J. Kirkpatrick.
290,919	25 Dec., 1883	B. F. Peet.
292,163	22 Jan., 1884	J. W. Fry.
292,351	22 Jan., 1884	A. J. Philbrick.
294,640	4 March, 1884	E. G. Latta.
294,641	4 March, 1884	E. G. Latta and A. C. Latta.
299,883	3 June, 1884	A. E. Wallace.
301,245	1 July, 1884	E. G. Latta.
301,934	15 July, 1884	H. M. Stillwell.
307,120	28 Oct., 1884	J. Knous.
307,133	28 Oct., 1884	T. Millward and C. Leni.
308,794	2 Dec., 1884	C. E. Pratt.
310,540	6 Jan., 1885	C. E. Pratt and A. E. Wallace.
310,776	13 Jan., 1885	W. P. Benham.
310,857	13 Jan., 1885	A. M. White.
311,188	27 Jan., 1885	J. Knous.
312,219	10 Feb., 1885	C. E. Pratt.

Number.	Date.	Inventor.
312,277	17 Feb., 1885	E. G. Latta.
312,411	17 Feb., 1885	A. E. Wallace.
312,732	24 Feb., 1885	J. Knous and A. E. Wallace.
313,083	3 March, 1885	J. Knous and A. E. Wallace.
314,142	17 March, 1885	T. J. Kirkpatrick.
314,160	17 March, 1885	C. L. Work.
314,633	31 March, 1885	A. E. Wallace.
315,026	7 April, 1885	R. Heeley.
317,956	12 May, 1885	A. M. White.
318,149	19 May, 1885	A. E. Wallace.
318,500	26 May, 1885	C. E. Pratt.
318,568	26 May, 1885	J. Knous.
319,470	9 June, 1885	F. J. Drake.
321,508	7 July, 1885	E. G. Latta.
32–,543	21 July, 1885	J. Knous.
322,733	21 July, 1885	E. G. Latta.
323,162	28 July, 1885	E. G. Latta.
324,264	11 Aug., 1885	E. G. Latta.
324,317	11 Aug., 1885	J. Harrington.
324,568	18 Aug., 1885	E. G. Latta.
325,420	1 Sept., 1885	E. G. Latta and A. C. Latta.
325,944	8 Sept., 1885	E. G. Latta.
329,852	3 Nov., 1885	A. H. Overman.
334,829	26 Jan., 1886	A. E. Wallace.
	26 June, 1886	G. H. Day.
	13 July, 1886	J. N. Waite.

477 And whereas said party of the second part is desirous of making, using, and selling to others to be used bicycles, tricycles, and other velocipedes embodying in their construction and modes of operation certain of the said inventions and of securing license therefor under certain of said letters patent:

Now, therefore, in consideration of one dollar by the party of the second part to the party of the first part paid, the receipt whereof is hereby acknowledged, and in further consideration of the covenants, agreements, and stipulations hereinafter contained, said parties have consented and agreed as follows:

First. The party of the first part agrees to license and does hereby license the party of the second part, subject to the conditions and provisions herein named, to make and keep for sale at the shop or factory of the party of the second part, in Chicago, in the State of Illinois, or elsewhere, bicycles substantially like the Champion and those of better grade bicycles, tricycles, and other velocipedes having ball bearings on the drive-wheel, rear wheel, pedals, and elsewhere, and other velocipedes severally embodying any of the inventions set forth in any one or more of the above-named letters patent or in

any claim or claims thereof, except patents numbered (what do you wish to reserve), as far as applicable within the conditions and restrictions herein contained, and to sell said machines to others to be used, and to use the same within and throughout the United States and the territories thereof, and to export the same to foreign countries. This license is not to be understood or construed as a license to import, manufacture, buy, sell, or deal in bicycles or tricycles, or in pedals, saddles, springs, rims, bearings, or other
478 patented parts thereof separate from new machines or otherwise than as herein expressly stipulated, and except that said Gormully may buy, sell, and make repairs and supplies for his own make of machines and for the purpose of supplying his agents. This license is not transferable.

Second. The party of the second part hereby agrees to maintain a suitable place of business in said Chicago and to keep there on hand a stock of machines as above referred to, and to promote and aid in extending the interest in bicycling and tricycling and the use of velocipedes amongst those not already wheelmen, and to advertise that it is licensed by the Pope Manufacturing Company.

Third. The party of the second part agrees to keep at its said place of business full, true, and correct books of account, open at all reasonable times to the party of the first part and to its delegate, in which shall be set down all machines upon which any royalty is to — paid, as hereinafter provided, which are sold by the party of the second part, with the name and description thereof.

Fourth. The party of the second part agrees to make full and true returns in writing to the party of the first part on or before the tenth day of each calendar month in each year, beginning with the tenth day of ——, A. D. 1886, of all such machines on which royalty is to be paid (and whether any or not) which are sold in the United States by the party of the second part during the preceding calendar month, with the size, style, number, name, or description and make thereof. The returns of — to include all machines sold since July, 1886, on which royalty has not been paid, said returns to be made under oath whenever required by the party of the first part, and to pay the royalties or license fees as herein
479 stipulated on or before the said tenth day of each of said months of all said herein licensed machines used, consigned, or sold by them, or removed from their said factory or place of business in the preceding month.

Fifth. The party of the second part agrees to pay to the party of the first part the sums stipulated in section numbered "tenth" hereof upon each and every machine of the construction named in said section ten by or for him at any time prior to the termination of the license herein expressed as license-fees or royalties under said several letters patent or such or either claim thereof as may be used and as the consideration for this agreement, and it is agreed that the party of the second part shall so pay to the party of the first part, under this license and agreement, at least the sum of one thousand dollars within and for each and any consecutive twelve calendar months during the term of the license herein expressed.

Sixth. The party of the second part agrees to sell said machines and cause them to be sold at retail at not less than established list prices and not to sell the same or any of them during the term of this license to any person or party, either directly or indirectly, in violation of the hereinafter-contained stipulation in that regard.

Seventh. The party of the second part agrees to mark or stamp in a legible manner the word "patented" on each machine made or sold under this license, together with the date or dates of the patents under which each machine is made or sold, a list of such patents to be furnished by the party of the first part.

Eighth. The party of the second part, while this license remains in force and not longer, agrees that he will not dispute or contest the validity of any of the patents in respect to which he is li-
480 censed by section "first" hereof in so far as he shall elect to use the inventions shown and claimed by said patents; but it is understood that he is not bound to use said inventions nor any of them, but he shall nevertheless pay the royalties specified in section "tenth," and such payment shall be in full of all claims under or in respect to any of the patents under which the party of the second part is licensed by said "first" section hereof.

Tenth. It is agreed that the following royalties and no others shall be paid by the party of the second part as the consideration of this license, viz:

Upon bicycles substantially of the grade of the "Champion" and better, provided they embody patented inventions owned by the party of the first part and which are other than those embodied in the "Safety," "Challenge," or "Ideal" bicycles as the same are now made by the party of the second part or substantially so, the sum of five (5) dollars for each and every machine.

Upon bicycles which are not covered by the preceding clause, but which have ball bearings laterally adjustable, the sum of two and fifty one-hundredths dollars ($2.50) for each and every machine.

Upon tricycles covered by any of the patents under which the party of the second part is licensed by section "first," the sum of seven and one-half per cent. (7½%) of the retail price of such machines in standard finish, no extra royalty being chargeable for machines of higher-grade finish.

It is expressly understood that the "Ideal," "Challenge," and "Safety" bicycles, substantially as the same are now made by the party of the second part, without ball bearings, shall be free of royalty.

481 It is further expressly agreed that all machines manufactured for export shall be free of royalty, and if machines on which royalty has been paid shall afterward be exported such royalty shall be refunded.

It is agreed that the party of the second part shall not reduce nor allow his agents to reduce the retail prices of the bicycles on which five-dollar royalty is herein agreed to be paid unless and until the Pope Manufacturing Company shall reduce the prices of the "Expert" or "Light Roadster" bicycles to or below the present price of the Champion, and in that event said Gormully may make a

proportionate reduction. It is also agreed that said Gormully will not make a greater discount than twenty-five per cent. from said retail prices unless the Pope Manufacturing Company shall make greater discounts than at present, and in that event he will not make any greater increase in his discounts than is made by said Pope Manufacturing Company. It is provided, however, that if said Gormully shall improve the grade of said machines, as by adding hollow rims, tangent spokes, and other advantageous features, he may increase the retail price as he may see fit.

Eleventh. If and whenever the party of the second part shall fail to make returns or to make payments as herein provided or shall violate or fail to keep and perform the terms, conditions, promises, or agreements or either of them herein mentioned on his part to be kept and performed the party of the first part may withdraw and terminate this license and the agreements on its part mentioned to be kept and performed by notifying the party of the second part in writing that the license herein contained has been revoked; but no such revocation and no termination of this contract or any part of it shall release or discharge the party of the second part from
482 any payment or return which may have accrued, become due, or arisen hereunder prior to or at the date of such revocation or termination; and it is agreed that at the termination of the license herein contained at any time, by expiration, revocation, or surrender, the party of the second part shall pay the within-named royalty on all said herein licensed machines wholly or substantially finished or purchased or on hand or ordered by or for said party of the second part at the date of said termination, and that the party of the second part will not sell the same except by first paying the full amount of said royalty and by complying with all the terms and conditions of this contract in respect thereto.

It is further agreed that the party of the second part may surrender and terminate this license at any time, upon giving notice thereof to the party of the first part, in either of the following cases:

1st. If the Pope Manufacturing Company shall fail, after reasonable notice, to prosecute and suppress infringers of said patents or any of them covering the features upon which the royalties herein provided are based.

2d. If the Pope Manufacturing Company shall license any other person or persons to make like machines upon terms in any respect more favorable than those granted therein to the party of the second part unless like favorable terms are at the same time offered to the party of the second part.

3d. If by reason of the manufacture or importation and sale of machines of equal grade with the Champion or better or having anti-friction bearings the trade shall be disturbed sufficiently to compel a material reduction of prices.

4th. If the party of the second part shall desire to dis-
483 continue the business. Unless sooner terminated by revocation or surrender, this contract and license shall remain in full force and effect until November 20, 1894, and no longer.

Twelfth. Upon the execution and delivery hereof all license contracts heretofore made between said parties shall be and become null and void and all agreements, concessions, and admissions therein contained and all liabilities, obligations, and estoppels created by or arising out of such contracts of license or out of the dealings of the parties thereunder shall cease and be forever at an end, anything in any of said contracts contained to the contrary notwithstanding.

Witness our hands and seals the day and year first above written.

——. ——.

"EXHIBIT A," ATTACHED TO BILL ON CONTRACTS.

THE POPE M'F'G CO.
vs.
GORMULLY & JEFFERY M'F'G CO., R. PHILIP GORMULLY, and THOMAS B. JEFFERY.

This agreement, made by and between the Pope Manufacturing Company, a corporation established under and by virtue of the laws of the State of Connecticut, having a place of business in Boston, Commonwealth of Massachusetts, party of the first part, and Thomas B. Jeffery, of Chicago, State of Illinois, party of the second part, witnesseth:

484 That whereas said party of the first part own and control the following letters patent of the United States and inventions therein set forth and described, viz:

No. 3319, dated March 2, 1869, reissue, S. W. Smith;
No. 39349, dated July 28, 1863, P. W. Mackenzie;
No. 41310, dated January 19, 1864, P. W. Mackenzie;
No. 7318, dated July 31, 1877, reissue, Montpelier Manufacturing Company;
No. 46705, dated March 7, 1865, Harvey A. Reynolds;
No. 54207, dated April 24, 1866, Harvey A. Reynolds;
No. 30425, dated July 28, 1866, Harvey A. Reynolds;
No. 37999, dated March 16, 1869, Calvin Witty;
No. 59915, dated November 26, 1866, Pierre Lallement;
No. 7972, dated November 29, 1877, reissue, Richardson & McKee;
No. 3252, dated May 23, 1878, Harvey A. Reynolds;

And whereas said party of the second part is desirous of securing license and authority to work under said patents and to make and sell the inventions and improvements therein set forth and described:

Now, therefore, said parties have agreed to the following terms and provisions—that is to say:

First. The party of the first part agrees to license and does hereby license and empower said party of the second part, subject to the conditions and provisions hereinafter named, to make, use, and sell, to the full end of the term for which each of said letters patent are

granted, velocipedes and bicycles whose wheels are without
485 rubber tires and do not exceed forty-two (42) inches, embodying in their construction or mode of operation the inventions and improvements shown and described in each, all, or either of said letters patent.

Second. The party of the second part hereby agrees to make full and true returns in writing to the said party of the first part, on or before the 10th day of each calendar month in each year, of all velocipedes and bicycles containing said improvements so manufactured by the party of the second part during the month preceding, and the name or names of any and all purchasers of the same, and to pay the royalties or license fees accruing thereon on or before said tenth day of each of said months.

Third. The said party of the second part hereby agrees to keep full, true, and correct books of account, open at all reasonable times to the inspection of the party of the first part, in which shall be entered and set down all said velocipedes and bicycles manufactured or sold by them, and mark each machine sold patented.

Fourth. The said party of the second part hereby agrees to pay to said party of the first part the sum of (40) forty cents on all machines of 32-inch wheel or under, and 1 dollar on all over that size and not exceeding forty-two (42) inches as a license fee or royalty upon each and every velocipede so manufactured or sold by said party of the second part containing the improvements set forth and described in said letters patent or either of them.

Fifth. The party of the second part also hereby further agrees that they will not make or sell any velocipedes or bicycles other than those having wheels without rubber tires and not of greater diameter than forty-two (42) inches, nor in any manner, directly or indirectly, violate or infringe upon said letters patent or
486 either of them, nor dispute or contest the validity of the same or the title thereto of the party of the first part or their assigns, but will aid and morally assist said party of the first part in preventing infringements upon the same.

Sixth. In case said party of the second part shall violate any of the provisions, covenants, or promises herein contained on their part to be kept and performed, the party of the first part may terminate this license by notifying the party of the second part in writing that their said license has been revoked.

In witness whereof said parties have hereunto set their hands and seals, and to another instrument of like tenor and date, 16th day of March, 1880.

THE POPE M'F'G CO.
ALBERT A. POPE, *Pres't.*
THOS. B. JEFFERY.

"EXHIBIT B," ATTACHED TO BILL ON CONTRACTS.

THE POPE M'F'G CO.
vs.
GORMULLY & JEFFERY M'F'G CO., R. PHILIP GORMULLY, and THOMAS B. JEFFERY.

United States Circuit Court, Northern District of Illinois.

THE POPE MANUFACTURING COMPANY
vs.
T. B. JEFFERY. } In Chancery.

This cause having come on to be heard on the pleadings before Henry W. Blodgett, one of the judges of said court, and the case having been argued by the counsel for the respective parties, and it having appeared from the pleadings that the said defendant
487 was a licensee of the said complainant; that, according to the terms of the license, the said defendant agreed to pay to the said complainant certain royalties and do certain things and refrain from doing certain other things specified in said license; and the court, having fully considered the pleadings and the arguments of the rsspective counsel, it is hereby ordered, adjudged, and decreed—

1. That the said defendant shall pay to the said complainant the amount of $142.17 royalty due under the terms of said license.

2. That the said defendant shall be and hereby is perpetally enjoined from manufacturing or selling any bicycles, tricycles, or velocipedes except in accordance with the terms of the license heretofore referred to.

3. That the defendant shall pay the cost of this suit, to be taxed.

THE POPE M'F'G CO.
vs.
GORMULLY. } No. 824.

"COMPLAINANT'S EXHIBIT GORMULLY LETTER OF MARCH 5, 1883."
L. G. F., Examiner.

CHICAGO, *March 5th*, 1883.

The Pope M'f'g Co., Boston, Mass.

GENTLEMEN: I suppose you have been expecting to hear from me ere this. I arrived home only two or three days ago and have been extremely busy, so have had no time to write you, although I have thought a good deal about your matter. I have carefully examined form of license drawn up by Mr. Pratt, and find that it will
488 not do. In the first place, I object to a fixed price-list and discount—the former higher than any here and the latter much less—as I am told a discount as high as 33½ and 5 per cent. is commonly given, and the bicycles I am now making and which

I am selling under your special license are of a quality to well compete with other makers, but not at a price so much higher. If you will make that portion of license without binding me to a price and discount I will then pass that portion of it—that is, I will pay the royalties you name for each, providing I use all of your patents; but, as I spoke to you whilst there, and for which you drew up a specification for class A in section 9, it was for a cheaper bicycle, with round contractile tire, with bifurcated perch, but rear forks solid, with open head, with trouser guard and spokes to screw into hub, but not enlarged. This is what I wanted, not as Mr. Pratt wrote it, and for which I can make a demand, and which I still think I can make after next November, but am willing to pay royalties as agreed for class A, to keep peace in the family and so that you can realize out of instead of giving the profits to attorneys; class B to be as above, but to use another tire, made of rubber, but not as claimed by Serrel, whose patent you hold; for this, prices as agreed for class B. I should also wish inserted in clause 7, at the end of printed matter, "this to remain in force only until annulled as per section 9," as in case I should return contract at any time I should wish to be free to dispute any patent you may claim you cover. Again, in reading contract I do not find anywhere that you agree to protect me from unprincipled men who may try to make bicycles without any references to my interest or the balance of the bicycle family. There should be a clause that you would
489 prosecute all such offenders and pay all costs of such suits, and I think as long as I hold a license from you you should guarantee to indemnify me from any loss by such proceeding if I should continue to pay you royalties; and again, supposing some one should successfully resist any action you take against them, then I should have all royalties allowed or rebated from the time of commencing such suit, so that I can be on the same footing with the unprincipled manufacturer.

Should this meet your views, draw such a license and send to me and I will give it careful consideration.

Waiting your reply, I remain yours respectfully,

R. P. GORMULLY.

P. S.—I am working hard getting what stock I have on hand finished; will send you a sample shortly of a new bell, which I think I ought to be able to sell you.

THE POPE M'F'G CO.
vs.
R. PHILIP GORMULLY. } No. 824.

"COMPLAINANT'S EXHIBIT LETTER TO GORMULLY OF MARCH 10, 1883." L. G. F., Examiner.

BOSTON, MASS., *March* 10, 1883.

Mr. R. Philip Gormully, 228 Michigan avenue, Chicago, Ill.

DEAR SIR: Your favor of the 5th inst. is to hand and noted. We have been looking for word before, but supposed the delay was

owing to your absence, of course. Your letter shows us the
490 truth of what we suggested, that it was most desirable for us to come to conclusions definitely where we could talk. However, we will reply as best we can. You except first to "fixed price-list and discount." You know they are only fixed to minimum and maximum—that is, the price must not be less than certain list rates, no greater than certain others, allowing quite a range of variation, and the discounts no greater than 25 per cent. Now, we understood you to consent fully to that part when here and the best way to establish the field or class of machines you were to make. We cannot license you to make and sell now bicycles of the same sizes and at the same prices and discounts as the St. Nicholas & W. Toy Co., and so doing compete with them for their interests as licensees and also for yours. You wanted to make something different; then they do not compete with you, nor you with them, but all have a clear field. We never allow but 20 per cent. discount to our largest agents, so you would have a chance to exceed us in that if you wished, though we think you would not exceed 20 per cent. practically, as you wouldn't need to. Instead of making sacrifices to get away the other's field, you take another and have your own way in it.

Your second point is as to classes A and B, into both of which you want to put open head, bifurcated perch, and direct spokes at the same rates, the former to have the Serrell tire and the latter not to. We cannot afford to do that, nor would it be consistent with our other agreements. You can use socket head, bolted rear forks, and nutted spokes with those classes, you see; and if you go into the other things, why you make a finer machine, get a better price, compete with us and other licensees on higher class goods and pay full royalties.

491 As to the clause to be added to section seventh, we won't object to adding these words; but if you want it "understood that you dispute" any patents on returning license we cannot assent to any such understanding. The understanding we want is that you are to respect the patents and not join our enemies, if we should have any.

As to the protection from "unprincipled men who may infringe," we cannot give any better guarantee than our own interest at stake and our record for prosecuting every infringer. You need have no alarm on that score. Of course we should prosecute, and even if we were beaten in the end on any suit it would be after a cost to the infringer and a delay of his business that would far exceed the amount of royalties; they will have a "footing" that you would not want any guarantee to be equal to. If the patents were broken royalties would fall accordingly.

You will remember that the stock that you are working up was to be sold only on terms to be agreed upon when you should come. We may be willing to waive in some reasonable respects some of the restrictions as to this stock, if you wish it. Mr. Jeffery, in your absence, has made us much trouble by reporting and stirring up the trade to the detriment of our licensees. We hope it will not be

continued and that we may get this matter settled between us, one way or the other at once, as delay is injuring us.

Yours very truly, THE POPE M'F'G CO.,
C. E. PRATT, *Att'y.*

492 THE POPE MANUF'G CO. *vs.* R. PHILIP GORMULLY. } No. 824.

"COMPLAINANT'S EXHIBIT GORMULLY LETTER OF APRIL 23, 1883."
L. G. F., Examiner.

CHICAGO, *April 23d*, 1883.

The Pope M'f'g Co., Boston, Mass.

GENTLEMEN: Yours of the 12th April to hand, and in reply would say your review of our acquaintance is correct in some particulars. Since seeing you I have acted in perfect good faith with you. I have not done nor have I allowed any one in my employ to do anything derogatory to the wishes you expressed nor anything to in any way *to* annoy you or your licensees. Whoever has been writing you such a lot of nonsense either does not know about what he is talking or else is maliciously talking. I have not sent out any circular other than the one enclosed and which you saw long ago. I have not advertised any 50″ wheels—in fact, nothing but the book enclosed, as therein shown. I have not sold for any less than your licensees and in most cases I guess much higher—in fact, I have letters from agents complaining about prices charged and begging to have the same discount that the toy Co's give. There is nothing wrong in all this, and I am sure I can advertise my business as much as I like as long as I pay for it. Your two licenses received, but do not wish to sign unless clause 7 is entirely stricken out, so that we shall remain *in statu quo* until other matter is settled; also the sizes of iron wheels are not confined to 42″, as I am expecting to make them all
493 along as large as 46″, but that will not materially affect you. If that is agreeable I might sign it, but see no reason or do not see the necessity of this, as I shall pay royalties agreed to—in fact, have agreed to over my signature for this special permission granted by you. To review, you offer me a permanent license on certain terms and conditions. I am beginning to think with you and from what I have learnt from dealers that a good trade might be done in a higher-grade machine and at the prices you have stipulated, but I must be able to give 35 per cent. discount, as after much inquiry I am satisfied agents will not try to sell on a lower margin of profit than 35 per cent. If I can give them such a grade at a price-list 20 per cent. higher than the St. Nicholas, but with same discount for selling, then I see my way clear to do a good trade, and I think I make it clear to you. Again, when I left Boston nothing definite has been decided upon. I told you I had to think about it, and have been strongly thinking about it ever since, and have come or almost so to the conclusions as follows, after

paying considerable money to experts and getting legal opinions, viz: I am morally sure the brake mechanism as now applied does not infringe; also that Bramley & Parkhurst English patent, 6027, A. D. 1830, anticipates bifurcated perch; also that open head and stop does not infringe as now made. The saddles and cranks are a small matter, as that is settled by expiration of Lallement patent, and the rubber tire I can use any shape except round contractile, and am not sure but what the bobbin-winder anticipates Serrell's patent. Furthermore, I am informed that I can obtain in Paris information regarding the machine used by Michaux and others
494 prior to 1867 that will upset all vital claims. I have a friend who is now on his way to Paris, whom I have instructed to get all this information at my expense, and shall shortly have it. Now, in view of all these facts, I cannot understand why you will not try more to suit me. I am still willing to keep a combination to keep others out, but am unwilling to give you all of the profit. I am willing to give the appearance of your controlling me and not giving others the benefit of my information; am willing to make grade of bicycle you wish only with discount 35 per cent. so as not to interfere with your other licensees, but am unwilling to pay you such a royalty, but if you will make a reduction of royalties I should then be willing to make this arrangement for our mutual benefit, and to continue the business as a monopoly, and to save a lawsuit, which would be very expensive to me and to you, but I am morally certain and sure I should win in the end. You ask me to be frank. I am, and you cannot blame me for the position I take, knowing things as I know them or as they appear to me after hard study, and you do not seem able to show me them in a different light. If you were in my position you would do just the same. I notice you have lately lost a suit in Ohio. Does it amount to anything?

Please think this matter over and write me, and if you will only treat me one-half fairly we might yet come to terms and keep peace entirely in the bicycle family.

I am, yours respectfully, etc.,

R. PHILIP GORMULLY.

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COMPLAINANT'S EXHIBIT GORMULLY LETTER OF OCTOBER 29, 1884.
L. G. F., Examiner.

CHICAGO, *Oct.* 29, 1884.

The Pope Manufacturing Co., Boston, Mass.

GENTLEMEN: Yours of the 24th inst. to hand, and in reply would say that the time or date clause is not the only objection I have to form of license sent. I have inclosed it with pencil erasures and additions. Such alterations, I think, would be correct. In my last letter I asked you to simply extend the present contract I have with

you so as to enable me to make larger sizes, making in it same stipulations as to price, &c. Why not do that? You will notice in first clause I have struck out the words "and without hollow forks and ball bearings." I wish to make them with ball bearings at an extra cost, same as I now do the Ideal, and I might make them with hollow forks, as I wish to compete with the cheap English machines, which are now largely imported, and also in the making of racing machines, and should not wish to be debarred; then you will also find the license as you framed it confines me to retail trade in Chicago. I have erased at various places and interlined so as to conform with my present license; also portion relating to wheelmen. I think it beyond the province and arbitrary. I have certainly done a goodly share of advertising and will agree
496 to do so, but must be privileged to select my own journals and fields. I also object to your claims in patent 197,289, Peters ball bearings, as I think it would invalidate my claim to my globular bearing as now applied to the Ideal. I want to act in a fair, honest, and upright manner in this matter and expect you to be so equally with me. This may have escaped your notice, but it would not be fair for me to relinquish any claims I might have. I still think there is a lot of unnecessary verbiage, and cannot quite see the drift of it, and certainly, if of no use, why not just add a memorandum to present license and thus effect the arrangement without this new form? I have also made discounts, etc., conform to present license so as to keep absolutely within the field I now occupy, and wish to make a machine to be of exactly the same range of price and give dealers a chance to make a fair profit and sell them instead of the cheaper English machines. I enclose you a card and price-list of John Shire, Detroit, Mich. I find this man is interfering somewhat with my trade. He sold eleven (11) machines in one town in Michigan where I only sold two. Has this man a license? Waiting your reply,

I am, resp'y, &c., R. PHILIP GORMULLY.

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"COMPLAINANT'S EXHIBIT LETTER TO GORMULLY OF NOVEMBER 4, 1884." L. G. F., Examiner.

BOSTON, MASS., *Nov.* 4, 1884.

R. Philip Gormully, 228 Michigan Ave., Chicago.

DEAR SIR: Yours of the 29th ult. is just at hand and noted. You ask if John Shire has a license. He has, and we have not been informed of his traveling outside of it.

We cannot simply extend your present contract as you suggest, because that will not be satisfactory to us and will not secure our interests. We cannot give you a license to make bicycles with hollow forks and ball bearings, etc., to compete with the English machines in the market, nor to make racing machines. As to the

clause confining you to retail trade, this, we believe, was explained to you; at any rate, it is understood that all our licenses are granted in that form. They afterward consent to the price-list and where agents are allowed to sell at a discount the discount that should be allowed and the parties to whom it would be allowed. It was, as we understood, agreed that you should sell to agents and the trade, but not at the large discounts. We cannot consent to your selling to the trade and the dealers in our and other makes of bicycles at thirty-five per cent. on the larger sizes. We could not
498 give anybody a license to do that; not only because it would injure our own trade, but because it would injure everybody's trade. You are asking now for a license to make large sizes of bicycles, which would cause you to compete with us and our licensees. As twenty per cent. is the maximum discount that they are allowed to give, we cannot allow you to give any larger one on these sizes.

You remark in regard to the clause relating to advertising that it is beyond our province and arbitrary. Perhaps it is from your point of view, but it isn't from ours. First, because if we grant a license at all we have a right to name the terms upon which we grant it; in the second place, the Wheelman was founded for the express benefit of the bicycling interests, including, among other things, the promotion of the trade in bicycles and tricycles and their use by the general public, and a great many thousand dollars of our money went into it. The present magazine, "Outing," is not owned by this company, but it is doing more good to help along the interests in bicycles and tricycles by the general public outside of those reached by bicycle papers than any other publication in this country, and pays the best as an advertising medium. It was established to be supported, to the extent of advertisements, by all the trade. We take and pay for at their regular rates, as you see, fully our proportion of advertising space, but we notice that the others in the trade are not doing so. In one sense it is better for us, as it leaves our advertisement with less competition. In another sense it is not for our interest, because we are informed that the magazine, instead of making money, is losing it, and it is not for our interest and the interest of everybody in the trade that they should either be obliged to discontinue or else to reduce the
499 amount of money and space it devotes to the bicycle and tricycle business and literature. It has had to borrow money, and is borrowing money of us. Now, when we grant a license which allows anybody to compete with us it is neither arbitrary nor beyond our province to ask them to contribute something toward the support of that magazine.

You misread the license, probably, as to the Peters patent, as we do not ask you to admit in that license that the ball bearings on the "Ideal" infringe that patent. As drawn out it did ask you to admit the validity of that patent and the scope of it as covering ball bearings with means for lateral adjustment. We would not ask you to relinquish any claim which you have in any patent. Your criticism that the draft of license contains "unnecessary ver-

biage" is not only needlessly repeated but is an unnecessary fling at us, since, if it were not necessary from our point of view, it would not be there.

Now, we have explained that we cannot make a memorandum to the present license granting what you ask without you take a new license, and we positively decline to do so. If what you say toward the end of this letter and have said in previous letters is correct and all you want we are ready to grant you a new license which will give it to you on the terms which were included in the draft we sent you; if we license you at all it must be upon these terms; but if you insist on the requisitions in this your last letter and in pencil on the draft of license we must decline.

Yours truly, THE POPE M'F'G CO.,
By CHARLES E. PRATT, *Att'y.*

500 THE POPE M'F'G CO. *vs.* R. PHILIP GORMULLY. } No. 824.

COMPLAINANT'S EXHIBIT GORMULLY LETTER OF NOVEMBER 19, 1886.
L. G. F., Examiner.

CHICAGO, *Nov.* 19, 1886.

The Pope M'f'g Co., Boston, Mass.

GENTLEMEN: Enclosed please find draft of agreement which has been formulated in accordance with our conference and which I think covers all the ground and, when executed, will obviate all troubles and arguments between us for the future.

If satisfactory make and sign a duplicate and I will immediately sign and return to you and thus close up the business.

Waiting your reply, I remain yours truly,

R. P. GORMULLY.

501 In the Circuit Court of the United States for the Northern District of Illinois.

THE POPE MANUFACTURING COMPANY *vs.* R. PHILIP GORMULLY. } In Equity. No. 824.

THE POPE MANUFACTURING COMPANY *vs.* THE GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, and THOMAS B. JEFFERY. } In Equity. No. 829.

THE POPE MANUFACTURING COMPANY *vs.* THE GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, and THOMAS B. JEFFERY. } In Equity. No. 830.

THE POPE MANUFACTURING COMPANY
vs.
THE GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, and THOMAS B. JEFFERY. } In Equity. No. 845.

THE POPE MANUFACTURING COMPANY
vs.
THE GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, and THOMAS B. JEFFERY. } In Equity. No. 850.

Defendants' Testimony.

At Chicago, in the northern district of Illinois, on the 13th day of August, A. D. 1887, at 10 o'clock a. m., before me, Frederick C. Goodwin, a notary public within and for Cook county, Illinois, residing at Chicago, in said district, at the office of Offield & Towle, room 99, No. 185 Dearborn street, Chicago, Illinois.

Present: C. K. Offield, Esq., on the part of said defendants, and L. L. Coburn, Esq., on the part of said complainant.

502 And thereupon the following proceedings were had before me in said cause, pursuant to notice hereto attached:

Defendants' counsel calls as a witness THOMAS B. JEFFERY, who, being by me duly sworn to testify the truth, the whole truth, and nothing but the truth in said cause, deposes as follows in answer to interrogatories propounded to him by Mr. OFFIELD:

Q. 1. Please state your name, age, residence, and occupation.

A. Thomas B. Jeffery; age, forty-two years; residence, Lake View, Cook county, Illinois; occupation, manufacturer of bicycles and tricycles.

The further taking of testimony is hereby adjourned to Tuesday, August 16, 1887, at 2 o'clock p. m., by consent of counsel.

TUESDAY, *August* 16, 1887—2 o'clock p. m.

Met pursuant to adjournment.

Present: Same as before.

Defendants' counsel here offers in evidence the following-described letters patent:

Letters patent issued to L. Bishop, dated January 4, 1859, and numbered 22480, and requests that it may be identified and marked in this case as "Defendant's Exhibit Bishop 1859 Saddle Patent."

Counsel for complainant objects to the introduction of the above patent as evidence and all other patents for the following reasons: First, because the defendant or defendants have acknowledged the validity of the patents declared on; second, because the defendant or defendants have stipulated and agreed that the features complained of are covered by certain of complainant's patents

503 declared on in the bills of complaint, and that he or they would not manufacture such features or mechanisms; third, it is incompetent evidence for the purpose of showing that complainant's patents are invalid or that they do not cover the mechanisms

complained of, especially in view of the facts stated in the first and second objections, and also in view of the fact that the defendants have heretofore paid royalties to the complainant under licenses.

The objection is made to apply to the introduction of this patent and to all other patents or documentary evidence or any other evidence attacking in any way the complainant's patents. It is stipulated that this objection may be entered and apply to all patents here offered by defendants with the same force and effect as if offered specially to each patent.

Defendant's counsel offers in evidence the following letters patent, viz:

Letters patent issued to M. Nelson, dated April 10, 1860, and numbered 27824, and requests the notary public to identify and mark it in this case as "Defendant's Exhibit Nelson Saddle 1860 Patent."

Letters patent issued to J. C. Miller, dated April 10, 1866, and numbered 53854, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Miller 1866 Saddle Patent."

Letters patent issued to J. Curry, dated April 16, 1867, numbered 63864, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Curry 1867 Saddle Patent."

Letters patent issued to George F. Schmidt, dated June 6, 1871, numbered 115,772, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Schmidt 1871 Saddle Patent."

504 Letters patent issued to C. H. Harris, dated May 25, 1875, numbered 163,769, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Harris 1875 Saddle Patent."

English letters patent issued to James Alfred Lamplugh and George Frederick Brown, dated July 9, 1878, numbered 2751, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Lamplugh & Brown 1878 Saddle Patent."

Letters patent issued to J. Shire, dated June 3, 1879, numbered 216,231, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Shire 1879 Saddle Patent."

Letters patent issued to F. Fowler, dated May 11, 1880, numbered 227,511, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Fowler 1880 Saddle Patent."

Letters patent issued to F. Fowler, dated October 18, 1881, numbered 248,441, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Fowler 1881 Saddle Patent."

Letters patent to C. H. Veeder, dated January 10, 1882, numbered 252,280, and requests the notary to identify the same with this

record and mark same " Defendant's Exhibit Veeder 1882 Saddle Patent."

Letters patent issued to F. Lillibridge, dated March 4, 1884, numbered 294,645, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit Lillibridge 1884 Saddle Patent."

Letters patent issued to F. Lillibridge, dated March 2, 1886, numbered 337,171, and requests the notary to identify the same with this record and mark the same " Defendant's Exhibit Lillibridge 1886 Saddle Patent."

Defendant's counsel next offered in evidence the following-described letters patent:

505 Letters patent issued to J. Webster, dated June 18, 1861, numbered 32604, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit Webster 1861 Bearing Patent."

Letters patent issued to J. B. Blanchard, dated September 17, 1861, numbered 33292, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit Blanchard 1861 Bearing Patent."

Letters patent issued to C. Perley, dated February 24, 1863, numbered 37765, and requests the notary to identify the same with this record and mark the same " Defendant's Exhibit Perley 1863 Bearing Patent."

Letters patent issued to Bailly *et al.*, dated October 9, 1866, numbered 58739, and requests the notary to identify the same with this record and mark the same " Defendant's Exhibit Bailly *et al.* 1866 Bearing Patent."

Letters patent issued to J. White, dated December 24, 1867, numbered 72575, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit White 1867 Bearing Patent."

Letters patent issued to D. Jewett, dated May 26, 1868, numbered 78210, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit Jewett 1868 Bearing Patent."

Letters patent issued to Rufus P. Barnett *et al.*, dated December 1, 1868, numbered 84470, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit Barnett *et al.* 1868 Bearing Patent."

Letters patent issued to A. E. Smith, dated December 28, 1869, numbered 98436, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit Smith 1869 Bearing Patent."

506 Letters patent issued to A. Allcott, dated March 29, 1870, numbered 101,205, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit Allcott 1870 Bearing Patent."

Letters patent issued to F. A. Gardner, dated January 24, 1871, numbered 111,193, and requests the notary to identify the same with this record and mark same " Defendant's Exhibit Gardner January, 1871, Bearing Patent."

Letters patent issued to F. A. Gardner, dated April 18, 1871, numbered 113,867, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Gardner April, 1871, Bearing Patent."

Letters patent issued to Philip Reese, dated February 27, 1872, numbered 124,160, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Reese 1872 Bearing Patent."

Letters patent issued to J. M. Vernon, dated July 30, 1872, numbered 129,911, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Vernon 1872 Bearing Patent."

Letters patent issued to C. B. Sheldon, dated December 24, 1872, numbered 134,223, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Sheldon 1872 Bearing Patent."

Letters patent issued to J. Smith, dated November 20, 1877, numbered 197,421, and request the notary to identify the same with this record and mark same "Defendant's Exhibit Smith 1877 Bearing Patent."

Letters patent issued to Thomas B. Jeffery, dated April 17, 1883, numbered 275,917, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Jeffery 1883 Bearing Patent."

507 And also the following English letters patent:

Letters patent issued to Frederick Chinnock, dated February 15, 1853, numbered 392, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Chinnock 1853 Bearing Patent."

Letters patent issued to M A. F. Mennons, dated August 27, 1860, numbered 2057, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Mennons 1860 Bearing Patent."

Letters patent issued to Daniel Rudge, dated February 8, 1878, numbered 526, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Rudge 1878 Bearing Patent."

Letters patent issued to William Bown, dated January 29, 1879, numbered 369, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Bown 1879 Bearing Patent."

Letters patent issued to Thomas Palmer *et al.*, dated December 16, 1879, numbered 5145, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Palmer *et al.* 1879 Bearing Patent."

Letters patent issued to Nahum Salamon, dated March 18, 1880, numbered 1160, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Salamon 1880 Bearing Patent."

Letters patent issued to William Bown and Joseph Henry Hughes, dated March 22, 1880, numbered 1227, and requests the notary to

identify the same with this record and mark the same "Defendant's Exhibit Bown & Hughes 1880 Bearing Patent."

Letters patent issued to William Henry Monks, dated May
508 7, 1880, numbered 1880, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Monks 1880 Bearing Patent."

Letters patent issued to Thomas Humber *et al.*, dated June 22, 1880, numbered 2540, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Humber *et al.* 1880 Bearing Patent."

Letters patent issued to George G. M. Vernum, dated February 19, 1881, numbered 729, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Vernum 1881 Bearing Patent."

Letters patent issued to James Bate, dated November 14, 1878, numbered 4625, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Bate 1878 Bearing Patent."

Letters patent issued to William Stanley Lewis, dated January 13, 1879, and numbered 137, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Lewis 1879 Bearing Patent."

Defendants' counsel further offers in evidence the following English letters patent:

Letters patent issued to William Harrison, dated July 27, 1877, numbered 2870, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Harrison 1877 Handle Patent."

Letters patent issued to George Illston, dated November 12, 1879, numbered 4606, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Illston 1879 Handle Bar Patent."

Letters patent issued to Josiah Jackson, dated January 6,
509 1876, and numbered 60, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Jackson Pedal 1876 Patent."

Letters patent issued to Edward Richard Settle, dated January 22, 1881, numbered 282, and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Settle 1881 Pedal Patent."

Letters patent issued to Charles Chinnock, dated October 6, 1862, numbered 2702, and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Chinnock 1862 Bearing Patent."

Adjourned to Wednesday, August 17, 1887, at 10 o'clock a. m.

WEDNESDAY, *August* 17, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

Q. 2. Please state fully and in detail what knowledge or experi-

ence you have had, either practical or theoretical, which qualifies you to investigate and compare various mechanisms, and from such investigation and comparison point out the similarities and differences between such compared mechanisms; also state what knowledge, study, or experience you have had which enables you to understand the various mechanisms, their construction and operation, when such mechanisms are represented and expressed solely by the drawings, specifications, and claims of letters patent professing to represent the construction and operation of such mechanisms?

A. I have worked in machinery business twenty-five years. From 1867 to 1879 I made Patent Office models and other machinery and models for inventors and as exhibits in patent suits, which
510 business I carried on during that time in my own name and own account; and from '79 up to the present time I have manufactured bicycles almost continuously. It has been my business to invent and construct new forms and devices relating to bicycles and tricycles, and I have patented a number of such improvements. I have always investigated the state of the art about the time I made improvements, and consider I am well informed about the state of the art of bicycle construction generally.

Q. 3. Do you have any difficulty in understanding the construction and operation of mechanical devices, especially mechanical devices relating to bicycle or tricycle mechanisms or any analogous mechanisms, when your information as to such mechanisms consists solely of letters patent relating to the same?

A. None whatever when the specifications are clearly drawn.

Q. 4. Will you please state a little more in detail what practically has been your connection with the manufacture and sale of bicycles since 1879 down to the present time? I mean, has your experience been a personal experience, making you familiar with the manufacture of each and every part of bicycle structure during that time?

A. My experience has been a personal experience, and commenced in 1868 or '69, at which time I used and repaired bicycles—at that time called velocipedes—for one or two years. In 1879 I again commenced to use, also to manufacture and repair, bicycles and three and four wheeled velocipedes. My experience was entirely personal. My entire time has been devoted to the work of making the parts and superintending the putting together of those parts and, as I stated before, improving the mechanism used in bicycles.

511 Q. 5. Has the manufacture and perfection of bicycle structures occupied your entire study and time as an avocation since the year 1879?

A. Yes; it has, excepting perhaps three or four months out of that whole time, being my sole means of subsistence.

Q. 6. Can you personally ride a bicycle and practically understand its movements as an operator?

A. I can. I was one of the early members of the Chicago Bicycle Club, organized in 1879; was an active member of that club, I think, in the years 1880 and 1881, and have continued riding a bicyle from 1879 to the present time.

Q. 7. Are you the Thomas B. Jeffery appearing as one of the defendants to the several suits in relation to which this testimony is being taken?

A. I am.

Q. 8. Have you examined carefully so that you understand fully the letters patent issued to Alvin L. Peters *et al.*, dated November 20, 1877, and numbered 197,289 and appearing in the record as "Complainant's Exhibit Peters Patent," and more especially have you studied and investigated such patent as to the second claim thereof, its meaning and purpose?

A. I have. The Peters patent mentioned is for an anti-friction journal box. It describes accurately an axle having rollers running on its axle, the ends of the rollers being pivoted in a cage and cage made to revolve with the rollers as they turn in the journal box. Most of the description is given to the rollers and the rings which form the ends of the cage. One of the claims (claim 2) of this Peters patent describes the bearings with the shoulder bev-
512 eled or notched, as shown in Fig. 4. If the claim is to be construed to include the anti-friction rollers, having ends beveled to correspond with the bevel of the shoulder and nut of the axle, such construction is shown in the patent to Allcott, No. 101,205.

Q. 9. Are you familiar with the state of the art as represented by letters patent of the United States and English letters patent and which are offered in this case as "Defendant's Exhibit Webster 1861 Bearing Patent,"

"Defendant's Exhibit Blanchard 1861 Bearing Patent,"
"Defendant's Exhibit Perley 1863 Bearing Patent,"
"Defendant's Exhibit Bailey *et al.* 1866 Bearing Patent,"
"Defendant's Exhibit White 1867 Bearing Patent,"
"Defendant's Exhibit Jewett 1868 Bearing Patent,"
"Defendant's Exhibit Barnett *et al.* 1868 Bearing Patent,"
"Defendant's Exhibit Smith 1869 Bearing Patent,"
"Defendant's Exhibit Allcott 1870 Bearing Patent,"
"Defendant's Exhibit Gardner January, 1871, Bearing Patent,"
"Defendant's Exhibit Gardner April, 1871, Bearing Patent,"
"Defendant's Exhibit Reese 1872 Bearing Patent,"
"Defendant's Exhibit Vernon 1872 Bearing Patent,"
"Defendant's Exhibit Sheldon 1872 Bearing Patent,"
"Defendant's Exhibit Smith 1877 Bearing Patent,"
"Defendant's Exhibit Jeffery 1883 Bearing Patent,"
"Defendant's Exhibit Chinnock 1853 Bearing Patent,"
"Defendant's Exhibit Mennon 1860 Bearing Patent,"
"Defendant's Exhibit Rudge 1878 Bearing Patent,"
"Defendant's Exhibit Bown 1879 Bearing Patent,"
513 "Defendant's Exhibit Palmer *et al.* 1879 Bearing Patent,"
"Defendant's Exhibit Salamon 1880 Bearing Patent,"
"Defendant's Exhibit Bown & Hughes 1880 Bearing Patent,"
"Defendant's Exhibit Monks 1880 Bearing Patent,"
"Defendant's Exhibit Humber *et al.* 1880 Bearing Patent,"
"Defendant's Exhibit Vernum 1881 Bearing Patent,"
"Defendant's Exhibit Bate 1878 Bearing Patent,"

"Defendant's Exhibit Lewis 1879 Bearing Patent"?

A. Yes; I am familiar with all of them.

Q. 10. Calling your attention to claim 2 of this Peters patent particularly, I will ask you whether or not it is necessary to read and interpolate into that claim the rollers shown in Fig. 4 of that claim as a part of the claim itself.

A. Yes; most certainly.

Q. 11. Do you find that the adjustability particularized by this Peters patent is made any part of the second claim?

A. I do not.

Q. 12. Do you find that this Peters patent shows or describes, suggests or provides, for any other form of rollers than those specifically shown or described in this Peters patent?

A. I do not. This patent describes two kinds of rollers. Both kinds are cylinders made of iron or other suitable material of sufficient number and suitable in length, size, and form, which revolve around the spindle or bearing of the axle within the hub of the wheel. The specification states, also, that both ends of the rollers are made with a bearing which goes into rings or
514 their equivalents in such a manner as to allow the rollers to turn freely on their bearings as they revolve freely around the bearing of the axle or shaft. The specification says further: "If it is desirable to make the roller so long as to bring one or both rings outside the hub or box the outer part of the ring may be less in width than the rollers and the ends of the rollers made to bevel or taper to the rings." Then the patent says: "To retain the wheel on the axle, as the wheel of an ordinary road vehicle, the ordinary nut in use or its equivalent is made to bevel in conformity with the beveled ends of the rollers." This shows the modification requiring the beveled nut and beveled shoulder. They are used when the rollers are so long that the rings in which the rollers are pivoted extend outside of the box.

Q. 13. By the operation of this Peters patent is or is it not intended that the rollers shall bear throughout their entire length upon the axle around which they revolve?

A. It is, except that they may be made smaller in such places as may be desired to release them from supporting the bearing. Fig. 6 shows a roller not of uniform thickness, being reduced in diameter at two parts about midway between its center and ends.

Q. 14. Is "Complainant's Exhibit Peters Patent" the first patent by any means to disclose the anti-fraction bearings for journal boxes?

(Question objected to, and all other testimony of this character relative to the Peters patent, for reasons given above.)

A. No; such are shown and described fully in printed matter published long prior to the date of this Peters patent.

515 Q. 15. I now desire to call your attention to each one of the patents last enumerated and identified in this record as "bearing patents," and ask you to take up such patents specifically and state wherein, if at all, each or any of such patents contain- the

inventions or devices described and identified by the second claim of the Peters patent in suit, and you may treat this matter under two heads or constructions of this second claim; first, that the claim may be taken for the exact and specific devices covered by the claim; second, you may interpolate into the claim the rollers of the Peters patent, and may further assume that spherical balls may be substituted for the rollers of the patent.

(Question objected to for reasons given above, and, further, as to the patents that are not set up in the answer, because they are not so set up.)

A. If the claim 2 is interpreted to cover broadly the use of an axle with its shoulder beveled, combined with the nut or its equivalent, correspondingly beveled, then such construction is shown in the patents of Smith, 98436, December 28, 1869; Allcott, 101,205, March 29, 1870; Reese, 124,160, February 27, 1862, and Vernon, 129,911, July 30, 1872.

"DEFENDANT'S EXHIBIT SMITH 1869 BEARING PATENT."

This patent shows a carriage axle substantially like the axle claimed in the patent to Peters. It has a bearing marked "A" in the drawing, with a beveled shoulder marked "*e*" with the beveled nut "G." This patent also describes an adjustment. It states:

"By means of the screw-nut G it is evident that the conical follower can be adjusted toward the conical collar or shoulder
516 in such a manner that the journal bearing shall be solid, noiseless, and easily compensated for the wear of the parts."

It is an axle for a wagon. Its purpose is to run evenly and smoothly. It is anti-friction in its operation and meant to be used for the same purpose and in the same way that the Peters patent is, and, as expressed by Peters, it has for its purpose the "overcoming the friction of the bearing of all vehicles mounted on wheels." The bevel shoulder marked F is exactly like and in the same place and for the same purpose and operates in the same way as the beveled shoulder *e* on the wagon axle shown in the Smith patent. The nut G in Peters' specification is for the same purpose exactly, operates the same way, and is removed from the shoulder the length of the hub, the same as the beveled nut G shown on Smith's, and has the same bevel as the Smith nut. If desired, the axle shown by Smith could be inserted inside the cage of rollers and hub described by Peters and operate in exactly the same way and be substantially and completely the entire invention of Peters.

Recess.

"DEFENDANT'S EXHIBIT ALLCOTT 1870 BEARING PATENT."

In this specification I find a complete description of the axle or bearing and beveled shoulder and beveled nut as in the Peters patent, both beveled portions mentioned being at the respective ends of the bearing and partially supporting the hub. The beveled

shoulder corresponding to F in the Peters patent is found exactly in the Allcott patent and there marked *d*. The beveled nut corresponding to G in the Peters patent is found in the Allcott patent, corresponding in distance, form, and application
517 and marked D. The bearing is of corresponding length in the Allcott patent and performs the same functions as that shown in the Peters patent and marked B in the Allcott specification. The beveled shoulder and beveled nut shown in the Allcott specification has an additional flange concentric with the beveled nut and beveled shoulder, but this feature is in addition to *to* the bevel and — no way alters its character, use, application, or function as compared with the Peters patent, and I find every element in this Allcott specification that is shown and described in the second claim of the Peters patent constructed, operating, and being exactly the invention claimed in said second claim of Peters' patent. I have illustrated this fact by making a model of this Allcott device which exactly represents the second claim of the Peters patent without the rollers, which rollers I will discuss later. This model which I have made is constructed in exact accordance with the specification of the Allcott patent. It has the bearing shown on both patents, and on comparing this model with the Peters patent it will be seen that it has every element as set forth in the second claim of the Peters patent, namely, the bearing with the shoulder beveled or notched, combined with the nut correspondingly beveled or notched, as shown in Fig. 4. The model has, in addition to those elements, the concentric flanges on the shoulder and nut, as shown in Allcott's specification, but made capable of removal for the purpose of illustration. I have also provided rollers of the Allcott patent, with the case for the same, which I will describe later.

(Defendants' counsel offers in evidence the model just testified concerning by the witness and requests the notary to identify it with this record and mark it "Defendant's Exhibit Model Allcott Bearing Patent.")

518 "DEFENDANT'S EXHIBIT REESE 1872 BEARING PATENT."

I find in this patent a bearing with the shoulder beveled or notched, combined with the nut or its equivalent correspondingly beveled or notched, the shoulder shown at C in Reese's specification being identically the same form of shoulder shown at F in the Peters patent, and the beveled nut D in Reese's specification being precisely the same beveled nut marked G in Peters' specification. They are removed the same distance. The beveled portions face each other at the same angle and support the wheel in the same manner and for the same purpose, and in every way perform the same functions that the corresponding pieces in the Peters patent perform, as stated in the second claim. The whole device shown in Reese's patent, and also shown in Fig. 4 of his drawing, corresponds and is exactly the invention set up in claim 2 and shown in Fig. 4 of Peters' patent. The description in Reese's patent de-

scribes the beveled nut D as the follower, states that it "should be screw-threaded and so arranged upon the journal (in Peters' called the 'bearing'), which should likewise be screw-threaded, that it may be advanced toward the wheel. * * * The end of the journal, opposite the follower D, is provided with a similar conical bearing face. * * * It will be seen that when the journal is inserted in the hole or bore through the hub of the wheel and the follower nut is advanced toward said wheel until it is brought to bear against the conical seat in said hub the wheel will revolve upon the conical bearings," which shows conclusively that all the elements shown in claim 2 of the Peters patent are shown
519 also in Reese's patent, operating conjointly for the same purpose and constructed in identically the same way.

"DEFENDANT'S EXHIBIT VERNON 1872 BEARING PATENT."

This patent contains the same elements as set up in the second claim of the Peters patent. It does not contain rollers spoken of in other parts of Peters' patent, but it is an anti-friction bearing, has the same beveled shoulder and the same beveled nut and the same form of journal. The patent states: "I make the axle cylindrical for a short distance at *c*, terminating in a conical surface, C, the cylindrical portion *c* extending about or nearly half the distance through the wheel. * * * Upon this is run the conical nut B." I see no difference whatever in the device described in claim 2 of said Peters patent than in the device shown and described by Vernon. This axle *c* of Vernon's is shaped so that it would enter the bearing box of Peters', and the conical surface C would act as the bevel shoulder F of Peters', and the conical nut B of Vernon's would act as the beveled nut G of Peters', and be the exact device shown in Fig. 4 and described in claim 2 of the Peters patent.

If the claim 2 be construed to include the anti-friction rollers having their ends beveled to correspond with the bevel of the shoulder and nut, then such construction is shown in patent of Allcott, No. 101,205. The Allcott patent shows an axle with the shoulder beveled, combined with a nut or its equivalent correspondingly beveled and having bevel-ended rollers in contact with the beveled surfaces of the shoulder and nut precisely like the patent of
520 Peters'. The specification of Allcott states: I "have invented an improved anti-friction axle. * * * This invention has for its object the diminution of friction in ordinary axle boxes, and consists in constructing the hub box larger than the journal of the axle and filling the space between the journal and the box with longitudinal metallic rollers. * * * F represents the hub and G the box thereof, which latter is larger than the journal B, and into the space intervening are placed the larger longitudinal metal rollers H, which may be of any number and size sufficient to nearly fill such space around the journal. * * * The ends of the rollers H are also somewhat beveled to correspond with the tapering portions *d* and E of the journal B and nut D.

"The rollers H and I revolve freely, the former being in rolling

contact with the journal B and box G, and the latter with the rollers H, the whole tending to diminish friction and require no lubrication." Allcott claims also in his second claim the matter claimed in the second claim of Peters—namely, "the nut D, with its beveled groove H and beveled sleeve E, as and for the purpose set forth."

Referring further to the Allcott model, previously described, I have made some bevel-ended rollers and case to show the more complete device of Allcott. The rollers referred to are exactly the rollers shown also in Peters' specification. The flanges shown in this model have been made by me removable, so as to show clearly, when they are removed, the complete invention of Peters set up in his (Peters') second claim if the claim be construed to include the anti-friction rollers as well as the things definitely spoken of in said second claim of Peters, and I therefore regard the invention of Allcott, as far as all those parts I have mentioned—namely, the journal with the beveled shoulder and beveled nut combined, with the
521 rollers having beveled ends—to be exactly the same invention as set up in the Peters second claim.

Q. 16. Do you find the same means of adjustment with the same resulting effect of the parts identified in the second claim of the Peters patent in suit in any of the patents so far handled by you? And, if so, please identify such patents by name.

A. I do in the patents of Smith (1869 patent), Vernon of 1872, Reese of 1872, and Alcott of 1870. All those patents contain the same identical means of adjustment as Peters sets up in his second claim.

Q. 17. Assuming for the purposes of this question that the rollers of the Peters patent could be transformed into hardened spherical balls and the combination of the second claim of this Peters patent made operative by the substitution of sphe*p*ical balls for rollers, please state what patents you find in the state of the art which contain spherical balls for "overcoming the friction of bearings of all vehicles mounted on wheels and the journals of all revolving shafts, cylinders, and bearings of machinery." Please give your opinion as to each patent you may now treat as to whether or not such patents contain the improvement, object, or purpose just mentioned, and your reasons for any opinion you may express in this matter.

(Question objected to for reasons given above.)

The model introduced in the last answer of the witness to represent the Allcott patent, and its introduction as a model representing said patent, is objected to because it does not correctly represent the drawings in no particular. It omits grooves, small rolls, and shoulders, and is evidently made for the purpose of misleading, if not for deceiving, the court.

522 A. I find "Defendant's Exhibit Bailly *et al.* 1866 Bearing Patent" contains balls arranged in a circular series around the axles. Several forms are shown and described. Most of them contain two rows of balls, set at each inner end of a hub or box having surfaces conforming to the curvature with more or less exactness. The

description of the invention sets forth that it is for "improvements in the application of rolling friction to the axle boxes and journals of running shafts and axle-trees of machines and vehicles of all descriptions for lessening the resistance to the motion. * * * Fig. 1 is a longitudinal sectional view of the axle box of a road carriage where the wheel rotates and the axle is fixed." This view shows an axle box with four series of rollers, two of which are smaller than the others. The outer and larger series forms the hub bearing and run on hollowed but beveled surfaces, but differ from the Peters patent in having the beveled surface of the shaft oppositely inclined to the bevel in the box, with which the balls are in contact.

Adjourned to Thursday, August 18, 1887, at 10 o'clock a. m.

THURSDAY, *August* 18, 1887—10 o'clock a. m.

Met pursuant to adjournment.
Present: Same as before.

"DEFENDANT'S EXHIBIT JEWETT 1868 BEARING PATENT."

This patent shows and describes an anti-friction axle, having balls instead of rollers. The inventor states that "my invention consists in a journal or axle box provided with a series of spherical balls, which are placed in a circular recess or chamber and revolve in contact with the journal or axle, thereby reducing the friction to a great extent and entirely avoiding the necessity of employing oil or other lubricating material. * * * The journal B (representing the bearing of Peters') is caused to bear directly upon the balls D (represented by the rollers of Peters') and is supported thereby at each end of the box A (represented in Fig. 4, Peters', but not lettered) without coming into immediate contact with its interior surface. * * * The axle or journal B is held in place within the box A by means of the balls D, which, as before stated, fit into grooves *b* and prevent it from being withdrawn until they are removed from their chambers, thus dispensing with the ordinary screw-nut or other device at present used for this purpose." I regard this patent as a clear use of balls for bearings of vehicles, and the two grooves at the ends of the axle shown performing the functions of the beveled shoulder and beveled nut of the Peters patent, and the balls operating in the same manner as the rollers of Peters' to support the box and keep it from moving endwise.

523

"DEFENDANT'S EXHIBIT GARDNER APRIL, 1871, BEARING PATENT."

This patent illustrates and describes one end of an axle having its shoulder beveled at the same angle used by Peters for his beveled shoulder, and a duplication of these shoulders with balls would show the complete bearing of Peters' patent. This inventor has shown the operation of balls for the bearings of vertical shafts, in which the pressure is vertical; consequently, an oppositely faced beveled nut in this device is unnecessary. He has taken pains to inform

the public what angle the sides of the box opposite the beveled shoulder shall be to cause the bearing to revolve with the least friction.

524 "DEFENDANT'S EXHIBIT GARDNER JANUARY, 1871, BEARING PATENT."

This patent also shows a vertical bearing applied to a castor wheel, having balls to support the weight on the box which contains the balls. It has a beveled shoulder D. It has a screw device to hold the balls against the inner face of the box in which they run.

"DEFENDANT'S EXHIBIT WHITE 1867 BEARING PATENT."

This patent shows a ball bearing applied to a castor wheel which would act as the bearing for a wagon wheel if placed horizontal instead of in a vertical position and slightly modified without requiring any invention in view of what others have shown of the art. This device shows a bearing marked A, with the beveled shoulder represented by B, corresponding to F of the Peters patent, and the beveled nut or its equivalent, represented by the nut *n* and follower C, corresponding to the beveled nut or its equivalent of Peters'. The balls are shown at *a* rolling on the beveled shoulder and nut, respectively. This patent of White shows all the features claimed in the second claim, including the rollers, if such claim is construed to include such rollers, and operates in the same way as the device shown by Peters, Fig. 4.

"DEFENDANT'S EXHIBIT PERLEY 1863 BEARING PATENT."

This patent shows what he calls an "anti-friction roller." He employs balls for the rollers running in grooves in an axle, using three and four series of balls. He says: "By my aforesaid
525 improved bearings very much friction is avoided, the heating of the journals is prevented." The outer sides of the grooves of the axle shown by Perley corresponds to the beveled shoulder claimed by Peters, and a movable ring marked *d*, Fig. 1, of Perley's patent, having beveled edge on which the balls roll, corresponds to and is the equivalent of the beveled nut marked G of Fig. 4 of Peters' patent. In this Perley's invention the axle is designed to revolve and the box remain stationary, but either may be made to revolve while the other is stationary without any change being necessary in its construction, and by a change of position forms a bearing suitable for a wagon.

"DEFENDANT'S EXHIBIT SMITH 1877 BEARING PATENT."

This patent shows a carriage-wheel hub and axle having anti-friction balls instead of rollers, which shows the bearing with the shoulder beveled or notched, said shoulder marked C in Smith's

patent being the same as the beveled shoulder F of the Peters patent. It has the beveled nut marked D in the Smith patent corresponding to *to* the beveled nut marked G in the Peters patent. It has the hub running on the balls, taking place of the rollers of Peters'. All the parts operate in the same way for the same purpose as the bearing of the Peters patent, and it contains all the elements of said second claim of Peters', if the said claim is construed to include the rollers and such rollers be considered as balls.

"DEFENDANT'S EXHIBIT MENNONS 1860 BEARING PATENT."

This patent shows the application of hard metal balls to the working surfaces of axle boxes. He states: "In each end of
526 the axle boxes constructed on this system is placed a metallic collar, around the outer circumference of which is formed a groove or canal. Around this groove is distributed any number of hard metal spheres, * * * and over these spheres is fitted a second grooved collar formed in the metal of the box or inserted therein. The arrangement is completed by the insertion of the axle end in the inner collars, to which it is keyed or otherwise secured." The inventor describes the spheres as in pairs of unequal diameters. This, however, makes no difference in the construction of any part of the device. In the drawing, Fig. 1, the axle corresponding to Peters' axle is shown at A. The beveled shoulder of the Peters patent is shown in one portion of the ring marked M in the Mennons patent. The nut or its equivalent, correspondingly beveled, is shown in the ring L and nut K. The balls P of Mennons' act as the rollers of the Peters patent. The box or hub marked D in Mennons' patent revolves on the bearings substantially as the hub of Peters' revolves on its bearings. The balls roll at the extremity of the bearing, and the parts, separately and combined, are constructed and operate as do the parts described in claim 2 of the Peters patent, if such claim is construed to include the rolling devices and such rolling devices be construed to mean balls instead of the cylindrical rollers which he describes.

Recess.

Q. 18. Calling your attention again to Fig. 4 and claim 2 of the Peters patent in suit, state whether or not the described cage of that patent containing the operating rollers is, in your opinion, essential to a practical working construction of a device like Fig. 4 of this patent and was so intended by the patentee, although not specifically shown in said Fig. 4.

527 A. It is highly important that the cage should control the direction in which the rollers travel. I find that in each of the modifications shown and each of the descriptions given the application of the cage for thus controlling the rollers for the patent states: "To support and keep the rollers from running against one another, and thereby producing friction, both ends of each are made with a bearing which goes into rings or their equivalents in such a manner as to allow the rollers to turn freely on their bearings as

they revolve around the bearings." Then the patent states: The rings are fastened together and secured in a firm manner with a sufficient number of rods or bars passing from side to side between the spaces for the rollers, with room enough between the rings to allow the rollers to turn. These rollers, with the rods and rings which form a cage in which the rollers turn, are shown in drawings, Fig. 2, Fig. 3, Fig. 5, Fig. 7, and Fig. 8. In Fig. 4 the rollers are shown with journals on their ends adapted to fit in the cage and for no other apparent purpose, and the employment of the cage in connection with them is made clear in the specifications, wherein it states, after describing the rings of the proportion of width shown in Fig. 2, Fig. 3, Fig. 5, Fig. 7, and Fig. 8 of the drawings: "Or the outer part of the ring may be less in width than the rollers and the ends of the rollers made to bevel or taper to the rings." This shows, then, that the rollers are tapered; that their ends may be of the same diameter as the width of the rings. This drawing, Fig. 4, shows the rollers tapered to fit such rings of reduced width, and no other reason is given for tapering or beveling such rollers; and, as
the extremities of the rollers are provided with pivots of the
528 same proportionate size shown in the other drawings, it is
manifest to me that the rings are intended to be used, and the omission of one or two lines in the drawing is all that prevents the rings being shown there as clearly as they are described in the specification of the said Peters patent.

Q. 19. Would a device constructed exactly like Fig. 4 of this Peters patent, having no bearing contact between the roller and the axle, but having its entire bearing contact between the beveled ends of the roller and the beveled shoulder of the axle, be practical and operative as a structure; and, if not, why not?

A. As I understand, without rings and bars connecting them, they positively would not in operation if the pressure on this bearing is greater at one end than the other, as they would be in running a wagon. The end having the greatest pressure would cause that end of the rollers to adhere to the bevel and revolve, and, by reason of the opposite end having less weight and less adhesion, it would not revolve quite as far as the one to which the power to move it is most directly applied. This effect of the unequal movement of the ends of the rollers would cause one or more of them to lie in an oblique direction to the axle, in which position the rollers themselves would no longer turn on their journals, but, by the revolution of the hub, become wedged and be of no further use as an anti-frictional device.

Q. 20. Calling your attention again to the words "the bearings" of claim 2 of this Peters patent, as shown in Fig. 4, what, of necessity, must be "the bearings" contemplated by claim 2?

A. I understand by the word "bearings" the parts on which
the interior of the wagon hub bears. These parts in Fig. 4
529 consist of the cylindrical axle terminating in beveled shoulders and the parts forming the rollers which surround said cylindrical axle and on which the hub actually bears.

Q. 21. Do you find any statement in this Peters patent, or sug-

gestion, to the effect that any of the mechanisms therein shown can be employed in a bicycle?

A. There is no suggestion or indication. On the contrary, and although the use of bicycles was well known at that time, no mention is made of this journal box being adapted for use on bicycles.

Q. 22. Are you familiar with the construction and operation of the bicycle and tricycle structures of these defendants?

A. I am.

Q. 23. Did these defendants ever, to your knowledge, manufacture a bicycle or tricycle containing any device or suggestion of device shown or found in this Peters patent?

(Questions objected to for reasons given above.)

A. They have not.

Q. 24. Did you ever hear or know of any bicycle or tricycle being constructed in accordance with the suggestions or devices of this Peters patent and shown in Fig. 4?

A. I did not.

Q. 25. In your opinion could a "high-grade" bicycle be manufactured and put upon the market to-day having for its bearings the mechanism of this Peters patent and compete successfully with the bearing devices commonly employed in "high-grade" bicycles?

A. It could not.

Q. 26. Please examine "Complainant's Exhibit Defendant's
530 'Ideal Tricycle'" and "Complainant's Exhibit Defendants' American Champion Bicycle" and "Complainant's Exhibit Defendants' American Light Champion Bicycle" and state, if you know, who made these three several exhibits, and also if you thoroughly understand the construction and operation of each.

A. I have examined them. They were made by the defendants, and they do not contain the features described in the Peters patent and claimed in claim 2 of their patent.

(The last part of the answer objected to because the defendants have stipulated and agreed that the structures contained therein are covered by the Peters patent and that they will not make them, so far as the ball bearings therein contained are concerned, and because it is not responsive to the question.)

Q. 28. Please state whether or not you fully understand the construction and operation of the three exhibits identified in the last question.

A. I do fully.

Q. 29. You have just stated that these three exhibits do not contain the invention of the Peters patent as identified in claim 2 of that patent. Will you now go on and compare the mechanisms of these several complainant's exhibits of defendants' bicycles and tricycles with this Peters patent—as to its second claim—and give your reasons fully and in detail for the opinion you have expressed? Let your reasons cover, if you please, any one of the constructions you have contemplated or assumed may possibly be given to this second claim.

(Question objected to for reasons given above.)

A. I find in the rear wheels of defendants' bicycles a hub running on anti-friction balls, such hub being constructed with
531 enlarged outer ends, forming chambers in which are two series of balls. The hub bears on the balls in these enlarged ends and presses the balls downward and outward; the outward pressure being substantially horizontal with the downward pressure produces a pressure that is resisted by curved faces, one on the axle and one on the interior of each end of the hub. These faces are opposite each other and the balls running between them from the bearing and present a constantly changing axis midway between these faces, such axis being always inclined to both the horizontal and the vertical line. I see no resemblance to the Peters bearings in its construction. I see no bearings such as described in said second claim. I see also no room for such bearings and no part of the interior of the hub capable of being used with the Peters bearing. There is no ring or cage, no room or necessity for such ring or cage or for the pivots shown at the ends of the bearings shown in the various drawings and descriptions and claimed in claim 2 and shown in Fig. 4.

I find the pedals are constructed to run on anti-friction bearings, such bearings being substantially like the rear wheel of the complainant's exhibits and a description of which would be a repetition of such rear-wheel description. I find at the front wheel the axle running on bearing balls used as an anti-friction device, such balls being contained in a stationary box chambered to fit the balls closely, leaving no room for any cage or rings. These anti-friction balls are supported in a V-gro-ve on the axle. There is no nut or its equivalent beveled or notched as claimed and no pivots as shown in the Peters patent, Fig. 4, and no place adapted to receive such pivots, and the bearings are constructed in such a manner that no pivots are necessary.

532 Regarding "Complainant's Exhibit Defendant's Ideal Tricyle," I find no anti-friction bearings of any description. The bearing used on the rear wheel and pedals of the "Complainant's Exhibit Defendant's American Champion" and "Light Champion" is like the specifications of Mennons' of 1860, the Jewett patent of 1868, and the axle of each of those is constructed like the axle shown in Vernon's patent of 1872 and Reese's patent of 1875. The front-wheel bearing is constructed like the bearing shown in Fig. 5 of Mennons' patent of 1860 and Gardner's patent of April, 1871, and both the front and rear wheels and pedals are constructed like the patent of Smith, dated 1877.

Adjourned to Friday, August, 19, 1887, at 10 o'clock a. m.

FRIDAY, *August* 19, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

It is evident from the exhibits set up by defendants that they have entirely avoided using the rollers or inventions of Peters', shown by

his patent, claim 2 or any other claim, but have taken from the common art, which is now public property, the inventions set forth in patents of Mennons, Jewett, Vernon, Reese, and others mentioned, and avoided the use of rollers, which were also well known in the art, but which operate in a manner that they deemed unsuitable for a bicycle structure. The roller bearings are distinct and different in operation from ball bearings. They, the rollers, have one predetermined axis to run on. They require some means for keeping this axis in line with the axis of the shaft they run on. They usually have an extended frictional contact throughout their length on the shaft on which they run and against each
533 other. The operation of balls differ in their not having any predetermined axis to roll about or on. They roll on an ever-changing axis. They require no cage or rings to keep their axis in any line, and their axis changes with every movement of the bearing. For these reasons they are classed as two distinct forms and types of anti-friction devices.

Q. 30. Do the defendants manufacture their ball-bearing devices as shown in their bicycles offered in evidence by complainants; and, if so, under what letters patent, identified by name, number, and date?

A. They do under patent to John Smith, dated November 20, 1877, and numbered 197,421, and to Thomas B. Jeffery, dated April 17, 1883, and numbered 275,907. Both of these patents are owned by the defendant corporation and have been offered as defendants' exhibits.

Q. 31. Have you any suits pending against any parties manufacturing bicycles for an infringement of this Smith patent; and, if so, against whom?

A. The defendant corporation have suits pending against the Pope Manufacturing Company, the complainants to this suit, and against the Overman Wheel Company.

Q. 32. For what reason or reasons did the defendant corporation purchase this Smith patent?

A. Because the defendants thought they were infringing this patent and suits might be brought against them by the inventor or purchasers of that patent and for the reason that we might protect our business by working under that patent.

Q. 33. Have you examined carefully so that you fully understand the same and the construction and operation of the mechanism therein described and claimed, "Complainant's Exhibit Wallace Patent No. 1"?

534 A. Yes; I have, and fully understand the patent and mechanism shown.

Q. 34. Please compare this "Wallace patent No. 1" with the several ball-bearing patents offered as evidence by defendants in this case and state whether or not any such exhibits prior in date to Wallace patent exhibit identically or substantially the same inventions, elements, combinations, and devices as shown and exhibited by the second and third claims of "Complainant's Exhibit Wallace Patent No. 1."

(Question objected to for reasons given above.)

A. Claim 2 of this patent is for a ball bearing for a wheel and axle, consisting of a one-part bearing box, marked H in the specification, and a two-part sleeve, S and S′, having a circular row of balls, mark- O O, within said box H and between bearing surfaces in the box and on either part of the sleeve S and S′, and adapted for adjustment for wear and securement in position on an axle by a screw-thread at the outer end of one part of the sleeve operating to draw it toward and from the other part substantially as set forth. This form of bearing is shown in "Defendant's Exhibit Bate 1878 and Monks 1880 Bearing Patents." The patent of Bate shows several forms of adjusting devices; one of them, Fig. 18, shows a one-part bearing box, having a circular row of short and curved-ended rollers between said box and between bearing surfaces in the box and on either part of the sleeve, and adapted for adjustment for wear and securement in position on the axle by a screw-thread at the outer end of one part of the sleeve, and in this illustration operating to draw it toward but not from the other part. The description of this device differs from the description in claim
535 2 of the Wallace first patent, for it employs short round-ended rollers instead of balls, and the screw outside of the sleeve operates to move the same toward the rollers and close the groove, but is not constructed in such a way as to move the sleeves apart or enlarge the space for the rollers, but can only operate to move the sleeves together. Fig. 20 shows a modification of the two-part sleeve. This sleeve is adapted for adjustment for wear and securement in position by a screw-thread at the outer end of one part of the sleeve operating to draw it toward and from the other part. In the drawing of Bate's patent, H represents one part of the sleeve and K the other part. The outer part of the sleeve H of Bate is formed with a screw-thread so arranged that by the revolution of the part K, corresponding to the revolution of the sleeve S′, it is moved toward the other part of the sleeve, and by movement in the reverse direction it operates to draw itself from the other part of the sleeve, thus enlarging the space between the two sleeves. This drawing, Fig. 20 of Bate, does not show either rollers or balls, but its shape and means for adjustment is eminently adapted for balls and not for rollers. The description of this device, "Fig. 20, illustrates in section a method of fixing and adjusting the cones of a velocipede axle bearing. * * * The fixed cone H is screwed onto the spindle and has a sleeve, J, formed solid therewith and screwed inside and out. The adjustable cone K is screwed upon the sleeve J, and is locked by the nut or collar L, also screwed upon the sleeve J."

In "Defendant's Exhibit Monks 1880 Bearing Patent" is described a similar means of adjustment of the sleeves. The patent states that it is "an improvement in the system of ball bearings. For the axle carrying the front wheel of the bicycle I employ a turned
536 bush conical at the outer end and a somewhat similar one which is screwed upon the outside of the first said bush. In

the V-shaped groove which is formed by these two bushes when in position I arrange a series of balls which rotate between the bushes and the lower part of the fork, which forms a cap somewhat circular, with a segmental groove in it for the balls to work in, or I may in some instances employ a double row of balls in a double groove and cone piece as above described. The outer end of the bush is formed into a milled or ratchet head, and is prevented from turning around after adjustment by means of a pawl fastened to a plate, my object being adjustment in a simple and efficacious manner when required."

These two patents of Bate and Monks show what is claimed in claim 2 of the first Wallace patent, namely, the described anti-friction bearing for a wheel and bearing, consisting of a one-part bearing box and a two-part sleeve. One of the patents describes a circular row of balls within said box and between bearing surfaces in the box and on either part of the sleeve. Both patents are adapted for adjustment for wear and securement in position on an axle by a screw-thread at the outer end of one part of the sleeve operating to draw it toward and from the other part. In referring to the screw-thread at the outer end of one part of the sleeve I understand by the word "outer" the part most exposed or nearest the adjuster. I consider this claim 2 of Wallace's to be fully described and explained in each of the two patents hereinbefore mentioned. Regarding claim 3 of Wallace's first patent, I would state it is shown in "Defendant's Exhibit Lewis 1879 Bearing Patent." The claim
537 describes an "anti-friction bearing for a wheel and axle, consisting of a two-part collar or sleeve adapted to enclose the axle, a one-part bearing box enclosing said sleeve and containing a recess with bearing surfaces, between which on either part the said sleeve is held a circular row of balls combined and constructed essentially as shown and described for securement in position and adjustment for wear by the pressure of one part of the sleeve against the hub of the wheel and by an external thread on the other part of the sleeve operating in an internal thread in a box secured to the axle on the opposite side." In the Lewis patent is shown the two-part collar or sleeve adapted to enclose the axle and marked B B corresponding in shape, position, operation, and purpose to the sleeves S and S'. This Lewis patent has a one-part bearing box, marked F, enclosing said sleeve and corresponding to the box marked H in the Wallace patent, and contains a recess with bearing surfaces, between which and a bearing surface on either part of said sleeve is held a circular row of anti-friction rollers. All the parts of this Lewis patent are combined and constructed for securement in position and adjustment for wear by the pressure of one part of the sleeve against the hub of the wheel and by an external thread on the other part of the sleeve operating in an internal thread secured to the axle on the opposite side of the hub. The external thread on the other part of the sleeve is not a part of the sleeve, but an independent threaded portion which operates to move the two sleeves together. I recognize in the screw formed of a separate piece from the sleeve a distinction, but its operation is the

same, its position is the same, except that it is incapable of drawing back the sleeve.

538 "DEFENDANT'S EXHIBIT MONKS 1880 BEARING PATENT."

This patent describes a similar anti-friction bearing for the front wheel of a bicycle. He states: "I employ a turned bush conical at the outer end and a somewhat similar one which is screwed upon the outside of the first said bush. In the V-shaped groove which is formed by these two bushes when in position I arrange a series of balls which rotate between the bushes and the lower part of the fork, which forms a cap."

These cones described are held clearly between the hub of the wheel and the crank, and may be used and adjusted for wear by the pressure of one part of the sleeve, and by threading one of the sleeves to the crank the pressure will be resisted by the hub of the wheel and operate in a boss secured to the axle on the opposite side.

For the purpose of illustration the operation of the patent to Bate, Fig. 20, I have prepared a model which shows the form of bearing described in the before-mentioned Bate specification, Fig. 20. This model has a two-part sleeve for an anti-friction bearing. They are adapted for adjustment for wear and securement in position on an axle by a screw-thread at the outer end of one part of the sleeve operating to draw it toward and from the other part, as set forth in claim two of the Wallace patent.

(Defendants' counsel here offers in evidence the model just identified by the witness, concerning which he has testified, and requests that the same may be marked "Defendant's Exhibit Model, Fig. 20, Bate Patent.")

(The introduction and use of the said model as illustrative of Fig. 20 is objected to because it does not conform to and correspond with said Fig. 20, and for the further reasons given above.)

Recess.

539 I desire to have it understood that this model of Fig. 20 of the Bate patent shows the part identified as Fig. 20 to be applied and substituted for the lettered central portion of Fig. 18 of the Bate patent. I have a model of Fig. 3 of "Defendant's Exhibit Lewis 1879 Bearing Patent," which shows clearly the invention and combination of the devices constituting the third claim of the Wallace patent, if any broad construction is given to the Wallace patent or any construction given to it other than confining the patent to the combination of the devices shown by the third claim.

(Defendants' counsel here offers in evidence the model identified by the witness, and requests the notary to mark the same "Defendant's Exhibit, Fig. 3, Lewis 1879 Bearing Patent.")

(This model objected to for reasons given in the last objection.)

It will be noticed that the bearing box and balls do not appear in the model, as their presence would be superfluous. The only

substantial difference between this model and the Wallace patent sought to be claimed in claim three thereof consists in the sleeve being moved toward the balls by a screw acting in such a manner as to move the sleeve toward the balls without causing the said sleeve to revolve.

Q. 35. Please carefully compare "Complainant's Exhibit American Champion Bicycle" and "Complainant's Exhibit American Light Champion Bicycle" with "Complainant's Exhibit Wallace Patent No. 1," and especially with the second and third claims of said Wallace patent, and state whether or not you find the alleged inventions, combinations, and devices recited in claims two and three of said Wallace patent to be found in either of the two exhibits of defendants' bicycles.

540 (Objected to for reasons given above.)

A. I have made the comparison between the complainant's exhibits, defendants' two bicycles, and the second and third claims of said Wallace patent, and I find that neither of said defendants' bicycles contain the alleged inventions, combinations, or devices of either the second or third claims of Wallace patent No. 1 for the following reasons: The only thing that I find new in the Wallace patent, claim two, is the screw-thread on one of the sleeves operating to draw it toward and from the other part. The drawing shows and the specification describes this sleeve having a screw-thread as made to revolve on the axle and in a fixed nut on the axle. The nut being so fixed causes the sleeve by its rotation to move towards the balls, and by its rotation in an opposite direction is removed from the balls by reason of the screw-threads operating in the fixed nut. I do not find in either of the complainants' exhibits defendants' bicycles any mechanism which causes the sleeve to advance and be drawn backward; in other words, to draw it toward and from the other part. There is no fixed nut and no means provided for drawing the sleeve backward from the balls as described and claimed in the second claim of the first Wallace patent. In claim three of the Wallace patent the securement in position and adjustment for wear is obtained by the pressure of one part of the sleeve against the hub of the wheel, and by an external thread on the other part of the sleeve operating in an internal thread in a boss secured to the axle on the opposite side. In the Complainant's Exhibits "American Champion" and "American Light Champion" there is not any pressure of one part of the sleeve against the hub of the wheel, and there is no external thread on the other part, by which I understand the part of the sleeve fur-

541 thest from the hub operating in an internal thread in a boss secured to the axle on the opposite side or that furthest from the hub. The only part of this claim which is new, as a combination, is the sleeve operating in an internal thread which encircles the axle, and is secured to the axle on the opposite side from that pressing against the hub, and this arrangement I do not find in either of these complainant's exhibits bicycles. The device shown in Complainant's Exhibits "Champion" and "Light Champion"

and that shown in Wallace first patent are unlike in the origin of invention and unlike in the completed device. The Wallace patent follows the invention of Bate described as Fig. 20 when applied to the center of Fig. 18, and also described by Monks, whereas the Complainant's Exhibits Defendants' Bicycles "American Champion" and "American Light Champion" proceeds from the invention of Lewis. In the Bate construction, Fig. 20, a rotary movement of the adjustable sleeve advances and withdraws positively one sleeve from the other. In the revolution of the adjustable cone a complete turn of the cone must be made before the part that was upward becomes upward again; or, in other words, if the upper part becomes worn the advance of one sleeve in a circular direction will change that upper part from the position it occupied and it will not correspond with its associated worn part in the other sleeve; whereas on the Lewis invention, as shown in defendants' bicycles, the adjustable sleeve is moved without rotating and always presents the same parts of the adjustable sleeve to the corresponding part of the fixed sleeve, whether the bearings become worn or not. Moreover, in the defendants' bicycles the adjustable sleeve is moved by something which revolves on the axle, is not secured to the axle, and does not
542 operate to draw the sleeve from the balls. In this respect it is also like Lewis, Fig. 3, and the changes made on Lewis' invention do not in any way make it of the form or operate in the way shown by Bate's drawing, Fig. 20, or Wallace's patent, claim three.

Q. 36. Have you examined carefully so that you understand fully "Complainant's Exhibit Wallace Patent No. 2," and so that you understand fully the mechanism therein shown and described, particularly as to the second and third claims thereof?

(Objected to for reasons given above.)

A. Yes; I have, and I understand the mechanism described therein fully.

Q. 37. Please compare the alleged inventions and combinations of devices identified by the second and third claims of Wallace patent No. 2 with the prior state of the art represented by defendants' exhibits in suit relating to the same subject-matter and then state what you understand to be the alleged invention represented by said second and third claims of Wallace patent No. 2, and whether or not such alleged inventions are contained or found in the prior art in this record, either identically or substantially, giving your reasons for any opinion stated.

(Question objected to for reasons given above.)

A. The second claim of this patent of Wallace is for a combination substantially as herein set forth, of a two-part sleeve, a bearing box, a row of balls, a serrated annulus, marked *n*, and a locking button, marked K, with an axle and hub and flange. In the drawing accompanying this patent of Wallace is shown the inner part of the sleeve provided with "an annulus or circular projection from

the sleeve having a serrated periphery." The inner sleeve
543 described in the specification is stated to have an exteriorly threaded end, which screws into a correspondingly threaded mortise in a hub, D. The serrated annulus is necessarily and is shown to be a part of the adjustable sleeve. It operates by revolving on the axle whenever it is to be adjusted. It moves toward and from the unadjustable sleeve in the operation of adjustment, and it requires to prevent its movement around the axle by the movement of the axle in the ball case a locking button. This button, shown at K, is constructed to clamp securely the serrated annulus to prevent its moving around the axle in either direction. It is as necessary to hold the annulus from going forward as it is to hold it from going backward. The "Defendant's Exhibit Monks 1880 Bearing Patent" shows the invention sought to be covered in said claim two by the following words: "An improvement in the system of ball bearings. For the axle carrying the front wheel of the axle I employ a turned bush, conical at the outer end, and a somewhat similar one which is screwed upon the outside of the first said bush. In the V-shaped gro-ve which is formed by these two bushes when in position I arrange a series of balls which rotate between the bushes and the lower part of the fork, which *forces* a cap somewhat circular, with a segmental groove in it for the balls to work in, or I may in some instances employ a double row, a double groove, and coned piece, as above described. The outer end of the bush is formed into a milled or ratchet head and is prevented from turning around after adjustment by means of a pawl fastened to a plate, my object being adjustment in a simple and efficacious manner when required."

Referring again to the Wallace claim 2, the two-part sleeve
544 is described by Monks as "a turned bush, conical at the outer end, and a somewhat similar one which is "screwed upon the outside of the first said bush." The bearing box of Wallace is described by Monks as "the lower end of the fork which forms a cap somewhat circular, with a segmental groove in it for the balls to work in." This last quotation also describes the position of the balls mentioned by Wallace. A serrated annulus and a locking button is described by Monks thus: "The outer end of the bush is formed into a milled or ratchet head, and is prevented from turning round after adjustment by means of a pawl fastened to a plate." The axle and hub of Wallace patent is illustrated by the statement in connection with the description that the parts are "for the axle carrying the front wheel of the bicycle," which necessarily implies the use of the hub, and the flange is described as "a plate" to which the pawl is fastened. I regard this description of Monks as a description of the second claim of Wallace. In the "Defendan'-s Exhibit Bown & Hughes 1880 Bearing Patent" is shown a two-part bearing box and a one-part sleeve, a row of balls, a serrated annulus, and a locking button fitted and adopted and intended for use with an axle and hub and flange. The difference between this device shown in Bown & Hughes' drawing, Figs. 1, 2, 3, and that of Wallace'- second patent, claim 2, is in the partition or division of

the adjusting portions. In the Wallace specification there is no substantial difference requiring invention to one acquainted with the device shown by Bown & Hughes. In the latter the box is the divided portion and the sleeve the undivided portion. Both operate to adjust in the same way, both patents have the same devices, and both inventions are intended for the same purpose. The description of Bown & Hughes' pat-
545 ent states: "D is a collar which is secured to the spindle of the bicycle by a pin passing through it or otherwise, the balls E E, of which there may be any suitable number, lying in the groove F F, formed in the said collar. G G is a loose cone and H an outer case. * * * Into this outer case is screwed the flanged adjusting collar L, which collar L is milled on the outer edge A A, as best seen at Fig. 1, for the purpose of receiving the corresponding milled portion of the pawl K, secured on the pin J', which holds the adjusting collar L in position and prevents it turning round." From the previous state of the art which I have here described I am unable to find any invention whatever in the device represented and attempted to be covered by claim 2 of the second Wallace patent.

The claim three of the second Wallace patent is for the combination, in a ball-bearing device, of a free bearing box, lettered G, and a shell case, E. By "free bearing box" I understand, as shown in the drawing of Wallace and described, to be a box fitting loosely in a case and capable of moving laterally as well as angularly. In "Defendant's Exhibit Salamon 1880 Bearing Patent" is shown the combination in a ball-bearing device of a free bearing box, marked A, Figs. 1 and 2, corresponding to G of the Wallace patent, and a shell case, B, corresponding to a shell case, E, of the Wallace patent. The free bearing box of Salamon's patent is surrounded with a rubber band, by which it is located in the shell case. The rubber band is shaped on the outside in the same way as the Wallace box is shaped, and the elasticity of the rubber admits of lateral movement, and its outer shape, which is globular, like Wallace's described bearing box, admits of the same angular movement. I regard this patent
546 of Salamon to be identically the same thing sought to be claimed in claim two of the second Wallace patent.

"Defendant's Exhibit Jeffery 1883 Bearing Patent" shows and describes the matter sought to be claimed in claim three of Wallace in the following words: "The front wheel is provided with the ordinary shaft L and case M, containing loose steel balls forming the bearings. The outer form of the case is spherical, having two sections removed, leaving two parallel sides pierced for the axle."

"The case is contained in a yoke or cavity shaped to conform to the case and formed at the lower end of the fork. This mode of connecting the ball cases prevents the balls being bound by a twisting strain or bend occurring in the forks."

This patent to Jeffery, one of the defendants, in my opinion, is an exact description of the device sought to be claimed in the third claim of the second Wallace patent, and there is no invention whatever shown by that claim in the light of the Jeffery patent.

Adjourned to Saturday, August 20, 1887, at 8 o'clock a. m.

SATURDAY, *August* 20, 1887—8 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

I have spoken of Bate's patent as to the Wallace patent solely from Fig. 20, which complainant follows, but Bate also shows a device, Fig. 20*a*, on the same principle as Lewis, which the defendants have followed in their construction. This device has the two-part sleeve, the adjustable one of which is moved endways on the axle and prevented from rotating by projections on the axle and
547 forced toward the balls by a nut behind it. This adjusting nut is adapted to press against the hub and the unadjustable sleeve against the crank or hub. I have made a model to more clearly show the device shown in Bate's patent, Fig. 20*a*. This model has the two-part sleeve, the bearing box and a row of balls being omitted. It is adjustable forward, but is incapable of being moved backward by the nut.

(Defendants' counsel here offers in evidence the model just testified to by the witness and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Model, Fig. 20*a*, Bate Patent.")

(The introduction of the model is objected to for reasons given above.)

Q. 38. Please compare the two Complainant's Exhibits Defendant's Bicycle Structures with "Complainant's Exhibit Wallace Patent No. 2," and especially with the second and third claims thereof, and state whether or not either of those exhibits contain the inventions, combinations, or devices of either the second or third claim of said Wallace patent No. 2, and give your reasons for your expressed opinions. You may, of course, also refer to any of the patents prior to Wallace No. 2 in evidence, or models, if you desire to use the same in connection with your opinion or reasons given.

(Objected to for reasons given above.)

A. I have compared the devices identified by this question with the second and third claims of the Wallace patent No. 2, and I do not find in the "complainant's exhibits" any locking button K or any equivalent therefor, any serrated annulus D, such as described in said second claim, or circular projection from the sleeve
548 having a serrated periphery. I do find a nut having ratchet teeth at its edge detached from the sleeve, and I do find a dog or pawl engaging with those ratchet teeth, but this pawl will not lock either the nut, sleeve, or anything else, its only use being to prevent the nut turning on the sleeve in one direction. It leaves the nut free to move in the other direction. It is not adapted to lock either part of the sleeve or prevent its moving endwise or around the axle, and therefore could not possibly be converted into the mechanism or operation of the second claim. I do not find in defendants' bicycles in evidence (as to the third claim) any free bearing box, such as described in the second Wallace patent, ca-

pable of moving in and freely fitting the circumference of the bearing box to provide for a variation in the transverse direction of the frame. I do find a bearing box and a case, the latter clamped securely to the former, preventing its being moved in any direction without considerable effort. The bolt provided in the two sections which compose the case, which is made to divide to receive the bearing box, can only be used to clamp the two sides to the case and secure it rigidly, and it does so secure it in the exhibit, preventing it absolutely from moving endways and angularly without very great effort. Principally for the above reasons I do not find that the combinations, inventions, or devices of either the second or third claim of Wallace's patent No. 2 are found in the bicycles made by these defendants. It will be noticed in relation to the third claim of Wallace patent No. 2 that the defendants' devices are made in exact accordance with the Jeffery patent of the date of 1883.

Q. 39. Please examine carefully, if you have not already done so, "Complainant's Exhibit Shire Patent" and state whether or
549 not you understand fully said patent and the construction and operation of the devices therein shown and described.

(Objected to for reasons given above.)

A. I have examined the patent identified by the question and fully understand the same and the construction and operation of the devices therein shown and described.

Q. 40. Have you examined also and do you fully understand the construction and operation of the devices therein shown and described in the following patents offered in evidence and marked respectively—

"Defendant's Exhibit Bishop 1859 Saddle Patent,"
"Defendant's Exhibit Nelson 1860 Saddle Patent,"
"Defendant's Exhibit Miller 1866 Saddle Patent,"
"Defendant's Exhibit Curry 1867 Saddle Patent,"
"Defendant's Exhibit Schmidt 1871 Saddle Patent,"
"Defendant's Exhibit Harris 1875 Saddle Patent," and
"Defendant's Exhibit Lamplugh & Brown 1878 Saddle Patent"?

(Objected to for reasons given above.)

A. I have, and understand fully the devices and mechanisms shown by those patents.

Q. 41. Please state what you understand to be the invention, combination, or device shown by the second claim of this Shire patent, and whether or not either substantially or identically the invention or device shown by this second claim is exhibited or found in any of the prior patents relating to this particular art to which your attention has just been called, and give your reasons fully for your opinion.

(Objected to for reasons given above.)

550 A. The claim two of the Shire patent reads: "In a velocipede the adjustable hammock seat J, substantially as set forth."

The description in the body of the specification recites that the invention consists "in the peculiar construction and application of the spring; second, in the construction and adaptation of the seat so that it is brought into close proximity to the driving wheel, thus allowing a wheel of greater diameter to be used than when constructed in the ordinary manner, and in the peculiar construction and arrangement of the various parts, all as more fully hereafter described." The drawing shows and description states that there are some devices between the driving wheel and the seat, namely, a spring and a perch or support for the rear wheel and a mud-guard described as a fender. The invention, therefore, cannot have been meant for the purpose of discarding the use of these elements, but for adjusting the height of the front of the leather composing the seat and for this purpose only. It is not designed to stretch the leather in any manner, but simply to raise and lower the front portion of the same which, incidentally, raises and lowers the center of the same. There is no provision for any adjustment at its back, for the back is described as being rigidly secured to a seat block, apparently of wood, this description being shown in the drawing and described in the following words: "To the top of this fender F is rigidly secured a seat block, H, to which is secured one end of the adjustable hammock seat J, the opposite end of which is provided with a strap and buckle, *h*, to engage with the loop *i* projecting from the rear face of the spring. By this construction it can readily be seen that the elasticity is derived from the metallic spring E," and necessarily the adjustment is derived from the operation of the strap and buckle.

551 I have made a model in accordance with the drawing and specification of the Shire patent. This drawing — a seat connected to the front end of the velocipede by a strap and buckle, being adjustable in height as in the patent set forth, and containing the supporting pieces for the rear wheel; also the spring and fender.

Defendants' counsel here offers in evidence the model just testified to by the witness and requests the notary to identify the same with this record and mark the same "Defendant's Exhibit Model Shire 1879 Patent."

(The introduction of the model is objected to for reasons given above.)

"Defendant's Exhibit Harris 1875 Saddle Patent" shows a hammock saddle having a front spring and loop connecting and supporting the leather identically the same as described in the Shire patent, but modified to be used on a riding saddle by a difference in the shape of the spring. This invention of Harris does not show a strap and buckle to connect the front of the leather to the spring, the loop operating for that connection. The patent provides means for raising and lowering the front end and, incidentally, the center of the hammock seat, and also provides a fixed rear support to the hammock portion. The description of the saddle states: "The object of my invention is to provide a saddle spring which will give

an easy and comfortable motion and which will subject the material of the saddle to the least possible strain and wear, and consists in attaching the forward portion of the leather forming the saddle seat to a peculiar shaped spring forming the pommel." This describes the attachment of the leather to its support and the purpose. The description states further: "From this construction it is evi-
552 dent that to convert my spring saddle into one having an ordinary seat it is only necessary to lift the bar *m* from the hook *c'* and the pieces *a a* rest snugly on the tree and the seat is deprived of any spring." This is equivalent to disconnecting the buckle of the Shire patent and allowing the seat to rest on the frame underneath it, and is the lowest position the leather can assume in either. The patent to Harris shows in the drawing the hammock seat in an intermediate position between the lowest and highest points it can be made to assume. The specification has not stated how the highest point is attained, but the drawing shows apertures in the leather at the rear of the bolts which connect it to the loop, and by moving the leather from the bolts in the front holes and placing the bolts through the rear holes of the leather the highest point of its adjustment is reached. This adjustment is substantially the adjustment that a buckle and strap would produce. Disconnecting a buckle from the front spring of Shire is substantially the same as disconnecting the metal loop of Harris' patent, allowing the leather to rest on the frame. The holes in the leather portion of the Shire patent operate in the same way as the holes in the leather of the Harris patent. They both have a highest point and a lowest point and intermediate points, the highest and intermediate being determined by the distance between the holes in the leather and the lowest by disconnecting the support from the spring. In my opinion this hammock saddle described in the Harris patent is identically the adjustable hammock seat I described in the Shire patent.

"Defendant's Exhibit Schmidt 1871 Saddle Patent" shows and describes a hammock saddle in which the leather is attached to the front and rear and suspended. The specification states:
553 "The leather seat F is suspended between the cantle and pommel, to which its respective ends are buttoned or otherwise attached." This word "otherwise," I understand, might include the use of a strap and buckle instead of buttons, the strap and buckle being employed for supporting and connecting other parts of the saddle being shown in the drawing, Fig. 1, and its use was obviously known to the inventor of the Schmidt patent.

"Defendant's Exhibit Lamplugh & Brown 1878 Saddle Patent" shows and describes, Figs. 1 and 2, a suspension saddle, substantially as claimed by Shire, with a different means of raising and lowering it. It will be noticed that the adjustable saddle seat, Figs. 1 and 2, is exactly the adjustable saddle seat J claimed to be invented by Shire. Its means for raising and lowering is provided by the inclination of the piece to which it is attached. The Lamplugh & Brown patent states: "Hitherto bicycle saddles have been made with a rigid iron plate inside the seat, being between the seat and lining of same.

We, in our invention, dispense with this said plate. We form the seat entirely of yielding materials, such as leather, silk, canvas, India rubber, cloth, or any other material suitable for our purpose, and then support the said yielding seat so that no part of the rider's thigh comes in contact with a rigid or unyielding substance." This explains clearly that the invention dispenses with the rigid plate usually employed, and supports the yielding seat on its ends. The adjustment for height the inventor did not deem necessary to allude to, but clearly shows in the drawings by inclining the support to which the seat is attached, and showing nuts and bolts by which its height may be adjusted. This inventor also shows a means for tight-
554 ening the leather of the hammock seat J, in Figs. 6 and 7, the tightening device used being a loop connected to a screw and shackle. This screw and shackle is not intended to adjust the height of the leather, but to stretch it. The same device, however, by changing its position would form a means for raising and lowering the seat, and also stretching the leather, substantially as the invention claimed by Shire and designated as claim two.

"Defendant's Exhibit Curry 1867 Saddle Patent" describes and shows an adjustable hammock seat, J, substantially as claimed by Shire. It consists of a flexible seat, supported at both ends by a cantel and pommel, and is provided with means for straining the seat, which means would also adjust the height of the saddle J. The means for straining is described as "thongs" and "stitches," which thongs and stitches perform the work of the buckle and strap of the Shire patent. The inventor does not claim any means for adjustment. The claim, however, concludes with the words "forming a skeleton frame for the support of the suspended seat."

Q. 42. Please compare "Complainant's Exhibit Defendant's American Champion Bicycle," "Complainant's Exhibit Defendant's American Light Champion Bicycle," "Complainant's Exhibit Defendant's Ideal Bicycle," and "Complainant's Exhibit Defendant's Ideal Tricycle" with "Complainant's Exhibit Shire Patent" and state whether or not you find the alleged invention of the second claim of that patent to be contained in the saddle structures of either of the four exhibits of defendants' machines just mentioned.

A. I have examined the exhibits identified by this question, and do not find any of them to contain the device claimed in the
555 second claim of said Shire patent. Neither of the saddles of the exhibits have the strap and buckle or any equivalent for the strap and buckle. Neither have any means of raising the front of the leather or moving the leather towards the front wheel without also moving both its points of support. In the American Champion and Light Champion the support of the seat differs from that of the Ideal bicycle and Ideal tricycle, but in no way are they or either of them the adjustable hammock seat J described in the Shire patent, claim two.

Adjourned to Monday, August 22, 1887, at one o'clock p. m.

MONDAY, *August* 22, 1887—1 o'clock p. m.

Met pursuant to adjournment.
Present: C. K. Offield, on the part of the defendants.

Q. 42*a*. Have you examined carefully so that you understand the same fully and the mechanism therein shown and described "Complainant's Exhibit Veeder Patent" in suit?

(Objected to for reasons given above.)

A. I have, and fully understand the same.

Q. 43. Have you examined, also, so that you understand the same and the respective mechanisms severally described therein, the letters patent appearing as exhibits in this record prior in date of issuance or application to this Veeder patent and relating to this same particular industry?

(Objected to for reasons given above.)

A. I have.

Q. 44. Please state what, in your opinion, is the invention shown by the first and second claims of this Veeder patent, and whether or not any of the prior patents in evidence in this case ex-
556 hibit either identically or substantially the invention or combination of devices as expressed by said first and second claims of Veeder.

(Objected to for reasons given above.)

A. The first claim of the Veeder patent is for a suspension saddle constructed with a flexible portion, C, and having an under spring in two or more parts, B D, to which the flexible portion is attached at either end, and which metallic parts are extensible, substantially as and for the purpose set forth. The specification states and the drawing shows an under spring fastened to an adjusting mechanism which is fixed to the backbone. The rear portion of the under spring is fastened to the forward under spring and made to slide on it. The saddle is provided with a clamp, F, to fasten the two portions of the spring together independently of its means of attachment to the backbone. A screw, F, is provided and connected to the rear portion of the under spring and made to press against the forward under spring in such manner as to separate the front and rear extremities of the two parts, they being always connected together. The patent states: "My improvements relate to the class of seats known as saddles, and especially to devices for suspending the leather or other flexible material of which the seating surface is composed and for stretching or taking up the slack in same and for connecting same with the perch or bar; and my present invention, which is in the nature of improvements upon devices heretofore shown and described by me in applications for letters patent, consists. first, in a divided, metallic spring or supporting plate for the flexible seat; second, in a modification of that porton of said metallic spring which forms the framework of the rear of the seat; third, in mechanism

for elongating or extending said metallic spring so as to
557 take up the slack in the flexible seat; and, fourth, in mechanism for completing the support of the seat and connecting the same with the perch or supporting bar of the vehicle." The elastic portion of these springs is made to operate as much as possible in a vertical direction. The inventor's object, as disclosed in Fig. 6, is clearly to make a spring elastic in a downward direction. For this purpose the forward portion of the divided under spring is split, so that it may pass on each side of the backbone when depressed and remain connected to the rear portion of the under spring, that the adjustment may be retained, as described in other parts of the specification. I understand by this invention that the two under springs are made to be extended by a bolt described thus: "F' is an adjusting bolt, rectangular or otherwise, fitted to receive a wrench at one end, f^3, by which it may be turned and threaded to work in the threaded hole in the bolt clamp F, and so constructed that its threaded end, f^4, may work against the stop b^2." This adjusting bolt is shown to be a horizontal bolt, and its purpose is clearly shown to be to separate the two portions of the under spring.

"DEFENDANT'S EXHIBIT SALAMON 1879 SADDLE PATENT"

shows a suspended seat having an under spring in two or more parts. The under springs are composed of rubber washers. They are placed at each end of an elastic bar. The seat is adjustable forward and backward on this elastic bar. This patent does not show any horizontal screw device for stretching or separating the springs,
but shows clearly an under spring at the front and rear,
558 separated from each other, but entirely supporting the weight of the rider and operating in nearly vertical planes.

If the claim 1 of said Veeder patent is to be construed to represent broadly a suspension saddle constructed with a flexible portion and having an under spring in two or more parts, to which the flexible portion is attached at either end, and which metallic parts are extensible by any means which may be employed, in my opinion, such construction is shown in this patent. The flexible portion is designated as *c*. The under spring in two or more parts, B D, is represented by the forward elastic washers *f* and by the rear elastic washers f^1. There is in this patent no means shown for extending the metallic portions.

"DEFENDANT'S EXHIBIT FOWLER 1880 SADDLE PATENT"

shows and describes a suspension saddle constructed with a flexible portion and having an under spring in two or more parts, to which the flexible portion is attached at either end and which metallic parts are extensible or adjustable toward one another in this patent. The front under spring is a spiral spring, acting in a vertical direction, and the rear under spring is a flattened bow spring. The flexible portion is metallic, but I do not understand that the material of which

the flexible portion is composed forms any part of this claim. No means are provided for forcing the two springs from one another, and in this respect differ from the description of the claim 1 of the Veeder patent; otherwise it shows identically the parts sought to be claimed in the first claim of the Veeder patent.

559 "DEFENDANT'S EXHIBIT SHIRE 1879 SADDLE PATENT."

This patent describes a flexible saddle suspended from front and rear and having an under spring in two or more parts. The inventor describes clearly the front portion of the under spring as the metallic spring E, and the front end of the leather connected to it, the rear end being secured to a block fastened to a fender or mud-guard. This fender is shown in the drawing of such construction that it is well adaped for giving a small amount of elasticity to the suspended saddle. It is, however, not described as a spring, but, in my opinion and knowledge of its operation, it gives considerable elasticity to the seat. In this patent no arrangement for extending the metallic portions of the seat is present.

"DEFENDANT'S EXHIBIT MILLER 1866 SADDLE PATENT."

This patent shows a suspension saddle supported at its respective ends upon springs that are separated from each other, but connected to a piece that retains them in the required position. These springs may be extended by removing the portion by which the spring is fastened to the piece which retains it and reattaching to the said retaining portion, but no device is shown for adjusting the extension.

It is evident from these patents that the invention or device of Veeder described in claim 1 is for an under spring formed of two pieces, clamped to each other and forming one spring, and capable of being extended in length to produce a longer or shorter spring, as required. The claim also must include the means for pro-

560 ducing the extension, namely, the horizontal screw device, and the parts named must be all clamped to each other and not to something which forms an intermediate unyielding part of the machine.

The claim 2 of this patent is: "In a velocipede seat the combination of plates B D, clamp F, stop b^2, and adjusting bolt F, substantially as shown and described." The plate B is described as "a narrow and thin plate of steel," and the plate D is described as "the rear portion of the spring or rather a second spring plate having a hole or slot in one end, d^2, or otherwise constructed so as to be held by a sliding bolt or clamp to the spring plate B." The clamp F is described as a bolt clamp, which may be threaded at one end to receive the nut *f*, between which and the plate D may be inserted a washer, *f'*, * * * to prevent it being drawn through said slot by tightening of the nut *f*, and by reason of which it serves in connection with the nut to form a clamp holding two plates B D together. It also has on the lower end a threaded hole for the adjusting bolt F.

"DEFENDANT'S EXHIBIT NELSON 1860 SADDLE PATENT."

This patent shows a saddle having the combination of plates B and D, stop b^2, and adjusting bolt F. It does not show a clamp, but does show means for directing the extended portion—that is, keeping it in line horizontally and verically—but has no means of securing one to the other, although both are constructed to form one elastic frame. The inventor states: "I introduce two rubber springs, *f f*, or their equivalents, one on each side of the saddle-tree.

561 In order to attach their rubber or equivalent springs in place and adjust them longitudinally of the saddle according to the weight and convenience of the rider I make use of slides 3 3 on the under side of the seat *c*, taking the metallic caps 5 to the springs *f f*, and 4 4 are slides on the saddle-tree *a*, receiving the cross-piece *e*, onto the ends of which the aforesaid springs *f f* rest. *d* is a screw operated from the back part of the saddle, by which the springs *f f* are moved nearer to or farther from the pommel or cantel of the saddle, as may be desired by the rider." In this patent the seat is composed of the same elements as described in claim 2 of the Veeder patent, namely, the plates *e* and *a* of Nelson's patent corresponding to the plates B and D of the Veeder patent. The adjusting bolt *d* of the Nelson patent is the same substantial bolt as the adjusting bolt F′ described in the Veeder patent. Stop b^2, shown in the Veeder patent, has its equivalent in the Nelson patent, and is shown when the head *d* of the adjusting bolt is stopped against the under plate *a*. No clamp substantially like that claimed in the Veeder patent is shown in the Nelson patent, but directing s-ides are shown and described which control the position of the spring horizontally and vertically. I am of the opinion that if the court finds that these directing slides of the Nelson patent are clamps or the equivalents of the clamps of Veeder, then it will be seen that the patent to Nelson contains every element of the second claim of Veeder.

Q. 45. Please compare the four mechanisms of defendants' machines put in evidence by complainants, being two bicycles and one tricycle, with "Complainant's Exhibit Veeder Patent," and more especially with the first and second claim- thereof, and state whether

562 or not you find the alleged invention or combination of devices recited by this first and second claim of the Veeder patent to be found in the saddle structure or accompanying parts of either of the four defendants' machines, and give your reasons fully for any opinions you may express.

(Question objected to for reasons given above.)

A. I have examined the machines identified by this question. In neither of the exhibits is there any under spring in two or more positions. In the Exhibits American Champion and American Light Champion I find an end spring placed at the forward part of the backbone and another spring at the rear of the backbone, but such rear spring does not have the flexible part of the saddle at-

tached to it. Both springs are separated and independently clamped to the rigid portion of the machines and do not form one spring. Their actions are independent and their purpose is entirely different from that intended by Veeder. The operation of the front spring is entirely endwise in its movement. It never gets nearer to the backbone or becomes depressed as the Veeder does, and its operation is always to pull the leather tight and prevent it from becoming sagged. It cannot be moved from the position given it by the manufacturer. This forward end spring is in no sense whatever an under spring or portion of an under spring. The rear spring is also fastended rigidly to the same rigid part of the machine. It has no means provided for moving or being moved, and its position can only be changed by the aid of independent implements, and if the leather is desired to be tightened the operator cannot do it by any means or device forming part of the machine. The rear spring is clamped to the backbone of the machine merely as an incident in its construction and is clamped thereto for the purpose of
563 avoiding the weakening of the backbone or making holes therein, which heretofore was the common practice. I would further say that after the machine leaves the manufacturer's hands there is practically no necessity for any change in the position of the rear spring and it is not so intended to be changed.

I find in the "Complainant's Exhibit Defendant's Ideal Bicycle and Tricycle" a suspension seat made with its under portion or frame in two parts and adjustable to increase or diminish the distance between the supporting parts of the leather, but this under frame is a solid, rigid iron support in two pieces, with an adjusting bolt. It does not have any clamp to secure one portion to the other, and neither of these portions can possibly be used as a spring plate, B and D, of Veeder. The rear portion of the iron adjustable frame is provided with a securing device, by which it is fastened to the ordinary single unextensible spring. The front portion of the iron frame is not clamped either to the unextensible spring, but is left entirely free, except being guided sideways and vertically.

For the above reasons I find that neither of the defendants' four machines contains the inventions or devices of either the first or second clause of the Veeder patent.

I have made a model representing the Nelson saddle device as shown by his patent, which illustrates the operation of that device more fully.

(Defendants' counsel here offers in evidence the model presented by the witness and requests the notary to mark the same "Defendant's Exhibit Model Nelson Patent.")

(The introduction of the model is objected to for reasons given above.)

Q. 46. Have you examined carefully, so that you under-
564 stand the same and the mechanism therein described, "Complainant's Exhibit Kirkpatrick Patent," particularly as to the first claim thereof?

(Objected to for reasons given above.)

A. I have.

Q. 47. Have you also examined the patents prior to Kirkpatrick in evidence as defendants' exhibits, so that you fully understand the same and the construction and operation of the mechanisms therein described and claimed?

(Question objected to for reasons given above.)

A. I have.

Q. 48. Please compare "Complainant's Exhibit Kirkpatrick Patent" with the prior patents here in evidence and state whether or not you find exactly or substantially that either or any of them contain the invention or combination of devices shown by the first claim of said Kirkpatrick patent.

(Objected to for reasons given above.)

Adjourned to Tuesday, August 23, 1887, at 9 o'clock a. m.

TUESDAY, *August* 23, 1887—9 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

A. I have examined and compared the complainant's patent with the prior art and find as follows:

"DEFENDANT'S EXHIBIT FOWLER 1880 SADDLE PATENT"

has the perch or backbone of a bicycle supporting two independent front and rear springs, which springs support a flexible seat directly at the front and rear.

565 "DEFENDANT'S EXHIBIT VEEDER 1882 SADDLE PATENT"

has "the combination, with the perch or backbone, of a bicycle of independent front and rear springs secured to said perch or backbone and a flexile seat suspended directly from said springs at the front and rear respectively, substantially as set forth" in the patent to Kirkpatrick and in the first claim thereof.

The independent front and rear spring of Kirkpatrick is described by Veeder as a "divided metallic spring," and fastened to the backbone shown in Fig. 6, a simple block intervening between them for a movement support. The parts of Fig. 1 shown by Veeder are also secured to the backbone, although some mechanism intervenes and effects securement. It has clearly the flexible seat suspended directly from said springs at the front and rear and the springs fastened to the backbone.

"DEFENDANT'S EXHIBIT BISHOP 1859 SADDLE PATENT"

shows and describes the combination of independent front and rear springs secured to a perch or backbone and a flexile seat suspended directly from said springs at the front and rear. In this patent B B are the front and rear springs, corresponding to E D of the Kirk-

patrick, and the flexile seat C corresponding to the flexile seat, also C, of the Kirkpatrick patent. The springs are fastened to a perch, A, corresponding to the perch, also A, of the Kirkpatrick patent. This perch of Bishop separates the front and rear spring, connects them together, forms a convenient intervening support for each spring separately, and retains them at a suitable distance from each other without being itself an elastic portion. It performs all the
566 functions in respect to the springs and the flexible saddle that the perch described by Kirkpatrick does and acts in precisely the same way. I have made a model which illustrates more fully the construction and operation of the Bishop saddle herein described.

(Defendants' counsel here offers in evidence the model referred to by the witness and requests the notary to mark the same "Defendant's Exhibit Model Bishop Patent.")

(The introduction of the model referred to is objected to for reasons given above.)

"DEFENDANT'S EXHIBIT MILLER 1866 SADDLE PATENT"

shows a saddle having independent front and rear springs to support it. These springs are fastened to a convenient perch, a portion of which perch separates the spring, and no mechanism intervenes between the seat and the perch in this or the former patent described by me. The seat is suspended directly from the springs at the front and rear. The springs are also bifurcated, and are adapted to go a limited distance on each side of the head of a bicycle, as shown in the Kirkpatrick. The seat of this Miller patent is not flexile to the extent that the Kirkpatrick seat is, but as flexile seats suspended on front and rear springs were well known at the date of the Kirkpatrick alleged invention, as shown by previous patents described by me, the substitution of one seat for another, in my opinion, constitutes no invention. For the above-described reasons I am of the opinion that whatever alleged invention is claimed by Kirkpatrick is solely the springs as described, the front one having two wings extending each side of the head and the rear one a single spring fastened to the top of the perch.

567 It will also be noticed that "Defendant's Exhibit Curry 1867 Saddle Patent" describes the combination, with the perch, of independent front and rear springs secured to said perch and a flexile seat suspended directly from said springs at the front and rear, substantially as set forth by Kirkpatrick, the only difference between the invention described by Curry and Kirkpatrick being the degree of elasticity of the springs, which are placed at the front and rear, independent of each other in every respect.

Letters patent to C. E. Duryea, dated February 19, 1884, bicycle saddle, No. 293,725, shows and describes the "combination, with the perch or backbone, of a bicycle or similar vehicle of independent front and rear springs secured to said perch or backbone and a flexile seat suspended directly from said springs at the front and rear respectively, substantially as set forth."

The forward spring of this Duryea patent forms part of the material from which the rear spring is constructed, but both springs are clamped to the perch in such manner as to make both springs independent in their action—that is to say, the front spring may be elevated or depressed and the rear one elevated and depressed independently of each other. The defendant corporation have owned for some time this patent to Duryea and have been working and making saddles in accordance therewith.

(Defendants' counsel here offers in evidence the patent referred to by the witness and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Duryea 1884 Saddle Patent.")

(Objected to for reasons given above.)

568 Q. 49. Please compare "Complainant's Exhibit Kirkpatrick Patent" with "Complainant's Exhibit Defendant's American Champion Bicycle" and "Complainant's Exhibit Defendant's American Light Champion Bicycle" and state whether or not either of those two exhibits contains the invention or combination of devices recited by the first claim of said Kirkpatrick patent, and give your reasons for your opinion.

(Question objected to for reasons given above.)

A. I have examined the patent and exhibits referred to in the question, and I do not find any independent front spring in the defendants' machines and in defendants' rear spring constructed in the manner described in the Kirkpatrick patent, nor do I find the flexile seat suspended directly from said springs, substantially as set forth.

Q. 50. Have you examined carefully, so that you understand the same and its described mechanism, "Complainant's Exhibit Latta Patent"?

(Objected to for reason given above.)

A. I have, and fully understand the same.

Q. 51. Please state what you understand to be the alleged inventions of the second and third claim- of this Latta patent, and if you shall find in the prior state of the art offered in evidence here any patent or patents which either identically or substantially contain or exhibit combination of devices of inventions of said second and third claims of Latta please identify such patents in your answer, and give your reasons fully in connection with your expressed opinions.

(Objected to for reasons given above.)

A. The invention described in the second claim of this Latta patent is "the combination, with the pedal frame, of a rubber pedal bar provided with a central longitudinal groove, *h*, and two bearing surfaces *h h'* on opposite sides of the groove *h*, substantially as set forth."

569 "DEFENDANT'S EXHIBIT HARRISON 1877 HANDLE PATENT"

shows, Fig. 12, what he calls "the fifth of my invention, being rubber of corrugated, ribbed, or fluted surface. B shows cross-section. C shows the hole through the center when used for pedals. Fig. 12 is specially for pedals used in velocipedes, as hereinbefore described." The inventor states in the body of the specification, describing the fifth part of his invention, that it is to prevent "slipping of the feet on the pedals in wet weather. * * * This corrugated rubber we place in the same position on the wheels and pedals as the ordinary smooth-surface rubber is placed at present. One rubber will be made with a hole through the center for the pedal spindle to pass through, while the other will be made solid for the bicycle, tricycle, or other carriage wheels."

This corrugated or grooved rubber described by Harrison and shown in Fig. 12 is the rubber pedal bar H described by Latta, which is provided with a central longitudinal groove and two bearing surfaces on opposite sides of the groove. It differs from the Latta description in having more grooves than the Latta shows, but does have the groove and bearing surfaces for the same purpose described by Latta—that is, it makes the bar more elastic, is easier on the feet of the rider, than the round, square, or triangular section bars mentioned at line 65, page 2, of Latta, and is easier to the feet of the rider, and the feet are less liable to slip off the bar, which Latta describes as the meritorious features of a rubber pedal bar provided with a central longitud-al groove. This pedal bar of Harrison is, therefore, the pedal bar described by Latta, the
570 pedal frame included as an element of the Latta patent being implied in the language of the specification and shown at Fig. 12, in the front and side elevation of the bicycle, Fig. 1.

"DEFENDANT'S EXHIBIT SETTLE 1881 PEDAL PATENT"

shows the combination with the pedal frame of a rubber pedal bar, H, provided with a central, longitudinal groove, *h*, and two bearing surfaces, *h' h'*, on opposite sides of the groove *h*, substantially as set forth. The inventor, Settle, states: "My invention consists of a model form of twin pedal rubber, one of which is used on each side of a crank wheel, consisting of two rubber cylinders joined together, and more or less resembling in section the Fig. 8, and through which two rods or pins are passed from the side of the frame, which prevent the rubbers from turning round on the pins." This pedal described by Settle and shown in Fig. 4 of his drawing has the pedal frame illustrated, the rubber pedal bar provided with one central, longitudinal groove, and the two bearing surfaces on opposite sides of the groove, identically as claimed in the Latta patent, claim 2.

"DEFENDANT'S EXHIBIT JACKSON 1876 PEDAL PATENT"

has also a rubber pedal bar, in combination with a rubber pedal frame, provided — a central, longitudinal groove, *h*, and two bearing surfaces on opposite sides of the groove. These pedal bars are secured in the same way that the pedal bars described by Latta —, have the same bearing surfaces, and the bearing surfaces are located and the pedal bars are used for the same purpose. The claim 3 of the Latta patent is for "the combination with the pedal
571 frame of a rubber pedal bar, H, pivoted to the frame by a rod, *i*, and provided on each of its sides with a longitudinal groove, *h*, and two bearing surfaces, *h h'*, on opposite sides of the groove, whereby the bar H is adapted to receive the pressure at its sides or edges and can be compressed on opposite sides of rod *i*, substantially as set forth."

"DEFENDANT'S EXHIBIT HARRISON 1877 HANDLE PATENT"

shows a pedal rubber substantially as claimed, having a round hole through its center for the pedal spindle to pass through. Nothing is stated about preventing this pedal bar from turning, and, if constructed as shown, would turn on the spindle, and the round spindle implied will turn in the round hole shown in the pedal frame. The rubber pedal bar is provided with the central, longitudinal groove *h*, and two bearing surfaces *h h'*, on opposite sides of the groove, substantially as described in claim 3 of the Latta patent.

In view of the above patents I find there is nothing new in Latta which could be the subject of a claim except the exact and precise devices shown in the patent, which appear to me to be of doubtful utility and without invention in view of such patents.

Recess.

Q. 52. Do you find the subject-matter of either the second or third claim of the Latta patent in either of the three defendants' bicycles or the tricycle of defendants offered in evidence by complainants; and, if not, why not?

(Objected to for reasons given above.)

572 A. I do not, because I do not find the central longitudinal groove running throughout the length of the pedal bar, as shown in the Latta patent, nor do I find the rubber pedal bar pivoted to the frame. The rods which I do find securing the rubber pedal bar to the frame are riveted to prevent them turning in the frame, and are made square, and the rubber pedal bars have square holes in them for the express purpose of preventing their turning. The surfaces of all of the rubber pedal bars substantially form a square, having four corners, and the rubber is removed from some of the faces for the purpose of diminishing the weight, and three different designs are shown in the three different styles of bicycles. All have a central longitudinal ridge instead of a groove, excepting

the American Champion, which has its surface on two sides paneled for lightness and two sides grooved, but such grooved side is not an operative side, and does not extend entirely across the face of the rubber.

Q. 53. Please examine "Complainant's Exhibit Benham Patent" and state if you fully understand the same and the device described therein, especially as shown by claims 1 and 3.

A. Yes.

Q. 54. Please also examine said defendants' exhibits prior to this Benham patent and state whether or not you understand the same, and whether or not any of such exhibits contain substantially the alleged inventions of the first and third claims of Benham, giving your reasons for your expressed opinions, and stating also, in view of the state of the art, in what, if anything, the invention of Benham as to his first and third claims consists.

(Question objected to for reasons given above.)

A. The first claim of the Benham patent is for "the com-
573 bination of an undivided bar and an open slotted lug and two sleeve nuts or their equivalents, one on either side the lug, surrounding the bar, and adapted to lock it rigidly to the lug."

"DEFENDANT'S EXHIBIT ILLSTON 1879 HANDLE BAR PATENT"

shows substantially and entirely all these elements operating for the same purpose and in the same manner. The undivided bar shown in Illston's patent *d* is the undivided bar B of the Benham patent. The open-slotted lug is shown in the Illston patent and called the "hollow bracket," shown in the drawing *a*, and corresponds with the open-slotted lu*b* *b* of the Benham patent. The two sleeve nuts called the screw-collars *e e* of the Illston patent are the two sleeve nuts marked C in the Benham patent. They are on either side of the lug in the Illston patent, as in the Benham patent, and they are adapted to rock the handle bar to the lug in the Illston patent just as rigidly as they do in the Benham patent. The Illston patent states: "My invention consists, first, of the construction and arrangement hereinafter described of the parts of detachable handles for bicycles. * * * I make near the top of the head of the bicycle or tricycle a cross hollow bracket open at its ends and top. The said bracket has externally a nearly cylindrical figure and its ends are furnished with convex screws. The interior of the hollow bracket is trough-shaped. I make the handle bar nearly flat at its middle, the bottom part being curved and of a size proper to seat itself in and fill the open top of the hollow or trough bracket described of the head. * * * On each side of middle,
flattened part of the handle bar is a sliding collar milled ex-
574 ternally and screwed internally with a concave screw proper to fit on the convex screw at the end of a hollow or trough bracket on the head. * * * By unscrewing the said screw-collars from the ends of the hollow bracket the handle bar is unfas-

tened and may be lifted from the hollow bracket and removed. The detachable handle is in this way readily connected to or disconnected from the head of the bicycle or tricycle, and when connected is very secure."

From the above-given reason I am of the opinion that the invention described and set forth in the first claim of the said Benham patent is exactly and clearly shown in the Illston patent.

The claim 3 of the Benham patent reads: "In combination with the handle bar B the detent D constructed and adapted to operate substantially as and for the purpose set forth." The description in the body of the Benham specification states regarding the detent: "This detent D, being rigidly attached to the handle bar and shaped so as to meet certain sides of the slot d', serves not only to locate the handle bar evenly and quickly by an even division of its length on either side of the middle line of the head, but also to prevent the handle bar when in position from turning or revolving on its axis." In the Illston patent before referred to the detent is used and shown in view Fig. 6, d^2, as a fixed projection at the middle of the bar. Its operation is to locate the handle bar evenly on each side of the head and prevent it turning round. The detent of the Illston invention is stopped against the sides of the trough and against the ends of the nuts which hold the handle bar in place, and in the Benham patent the detent is not stopped against the
575 nuts, but against the sides of the slot only. This is the only difference appearing in the two inventions, but is not material to the invention, and I am of the opinion that the patent to Illston shows completely "in combination with the handle bar B the detent D constructed and adapted to operate substantially as and for the purpose set forth" and recited in claim 3 of the Benham patent.

In view of the above I cannot find any invention in the patent of Benham whatever set forth in the first and third claims of this Benham patent.

Q. 55. Please compare the three defendants' bicycles put in evidence by complainants with the first and third claims of this Benham patent and state whether or not you find the alleged invention of the first or second claim of this patent in either of the three defendants' bicycles and give your reasons therefor.

(Question objected to for reasons given above.)

A. I have examined the exhibits and compared them with the claims mentioned, and I do not find any sleeve nuts or their equivalents on either side of the lug and adapted to lock it rigidly to the lug. I do find an undivided bar and an open-slotted lug and devices for securing the bar to the lugs, but they are not the equivalent of the sleeve nut, for the equivalent of the sleeve nut must be something capable of moving endwise on the lug or on the handle bar and operate by an endwise pressure either to compress the detent laterally into its fitting and thus secure the bar, and it does not operate to clamp the handle bar rearwardly against the lugs, and although the specification states that the nuts lock the handle bar

rigidly to the lug the nuts do not lock the handle bar to the lug, but lock the detent into its fitting, and the nuts lock themselves to the lugs, but do not lock the handle bar. Therefore the clamp in the complainant's exhibit which presses the handle bar rearward into the lugs is not the equivalent of the nut or nuts described in the Benham patent, claim 1. Regarding claim 3, I do not find any detent D constructed and adapted to operate substantially as and for the purpose set forth in the Benham patent that is rigidly attached to the handle bar and shaped so as to meet certain sides of the slot *d'*. For the above reasons I do not find in the "complainant's exhibits" the inventions described in claims 1 and 3 thereof.

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Q. 56. Do the defendants manufacture their bicycle structures, so far as the handle devices are concerned, under any letters patent? And, if so, please identify such patent.

(Question objected to as immaterial.)

A. They do. Letters patent to Thomas B. Jeffery, one of the defendants, dated December 29, 1885, No. 333,128, is used as their design and form of device, and which form is shown in the complainant's exhibits.

(Defendants' counsel here offers in evidence the letters patent above referred to by the witness and requests the notary to identify the same with this record and mark same "Defendant's Exhibit Defendant's Handle-Bar Patent.")

Q. 57. Have you examined carefully "Complainant's Exhibit Moran Patent," so that you understand the same fully and the described mechanism therein, especially as to its first, second, and third claims?

A. I have.

Q. 58. Please examine the several patents appearing as exhibits in this record on behalf of defendants prior to the Moran patent and state whether or not any of such prior patents exhibit the alleged invention or combination of devices of either of the three claims of this Moran patent, giving your reasons for your opinions and stating in what, if anything, the invention of Moran consisted in view of these prior patents.

577

(Objected to for reasons given above.)

A. "Defendant's Exhibit Harrison 1877 Handle Patent" shows and describes a rubber handle for a bicycle in the following words: "The fourth part of my invention consists of a sheath or glove of India rubber, cloth, or any other soft material, to fit closely, partly or entirely covering the handles of bicycles or tricycles, which may be filled with air. This is to obviate sore hands, to give greater comfort, especially in long journeys, to the hands, which lessens the vibrations and is softer to the hand grip, and also lessens the concussion in case of a bicycle falling upon the handles; the probability of bent handle bars and roughened handles is lessened thereby." "Fig. 4 represents a solid rubber handle, which can be

made in any form. A A is solid rubber, B B is the wood or vulcanite on which the rubber is placed. The wood B B must be of different shapes and sizes to suit different sizes of hands, which will of necessity alter the shape of the rubber. Fig. 5 represents simply a rubber or fluted rubber handle, but which in other respects is the same as Fig. 4. A shows end view. Fig. 6 is substantially the same as Fig. 4, except that it has a raised, diamond-shaped surface."

There is one patent to A. D. Tyler, dated September 19, 1882, No. 246,798, patented in England April 20, 1880, No. 1624, which has not been offered in evidence. This patent describes a handle formed with a rubber coating on wood or other non-elastic center.
578 It shows a thickened portion in its largest part, and is well adapted for a bicycle handle. The core of wood is largely for the purpose of saving material and to form a means for securing the handle to the handle rod. The inventor has claimed "a handle or holder superficially composed of India rubber or any of its elastic or non-elastic compounds, molded and vulcanized upon and about a central core, which is formed with an axial bore."

The patent to Moran describes the rubber handle with a central core of wood for the purpose of attaching it to the handle bar. He shows in the drawings three different styles of non-elastic cores. He states: "In applying my invention the ordinary handle is removed and in its place there is sleeved on the ends of the bar a block of wood, *b*, fitting such ends snugly and held in position by the handle nuts *c*, forming the core." It further describes the shape of the core and states: "By the use of this rubber handle it is seen that the object of this invention is accomplished. While riding the hands, and by consequence the body, of the rider is relieved of all jars, and if the machine should fall the handle would strike and relieve the blow. In Figs. 3 and 4 are shown a modification of the device. This consists of a rubber handle, *k*, in which the ball is made with a stem, *l*, and is slipped over the wooden block. * * * These handles may be made by placing the nut on the end of the core block and then molding the rubber over them. They are then put in position by slipping the handles thus constructed over the ends of the handle bar and turning them until the nuts are screwed home. If desired these handles may be vulcanized on, though the elasticity of the rubber would hold them in place." By this I understand the rubber may be vulcanized on
579 the core nut and block. "A still further form is shown, Figs. 5, 6, 7, and 8. In this instance the core block is larger at its outer end, which is provided with serrations, *r*, running from its outer end inward." It describes, further, catches and prongs for holding the leather onto the non-elastic core, but nowhere describes a handle made without some kind of non-elastic core. Moran further states: "I am aware that a rubber handle has been patented for knives, screw-drivers, etc., and therefore make no broad claim for a rubber handle, but only in its application to velocipedes." From this description I understand the claim 1, "the handle of a velocipede provided with rubber ends," is to be a handle formed with a core of some non-elastic material having its end formed of rubber; the

claim 2 to be for the handle of a velocipede formed of some non-elastic material with rubber tips sleeved upon its ends, and claim 3 for a rubber handle for a velocipede with a non-elastic center, the outer part consisting of a ball and neck combined in one piece, shown at Figs. 3 and 4, as a modification. In view, then, of the earlier art, as shown above, I cannot find any invention as claimed in the first, second, or third claim of this Moran patent when they are construed to cover a handle made with a non-elastic core and a rubber coating, the same having been shown in the patents above described, and if the same is construed to be a solid rubber handle I can find no invention in view of the patents also described.

(Defendants' counsel here offers in evidence the patent issued to Tyler and identified by the witness and requests the same may be marked Defendant's Exhibit Tyler Rubber Handle Patent.)

(Objected to for reasons given above.)

580 Q. 59. Please compare defendants' three bicycles and the tricycle put in evidence by complainants with "Complainant's Exhibit Moran Patent" and state whether or not either of them contain the alleged invention or device combinations of either of said three claims of Moran, giving briefly your reasons.

(Objected to for reasons given above.)

A. I have examined the said three exhibits, and I do not find any handle of a velocipede provided with rubber ends as set forth in the Moran specification. I do not find any handle of a velocipede in combination with rubber tips sleeved upon its ends. I do not find a rubber handle for a velocipede having a non-elastic core and consisting of a ball and neck combined in one piece, as set forth. The handle on these exhibits is substantially the handle patented to Harrison, and the handle of Moran is practically the handle of Tyler.

Adjourned to Wednesday, August 24, 1887, at 9 o'clock a. m.

WEDNESDAY, *August* 24, 1887—9 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

Q. 60. Please examine carefully "Complainant's Exhibit Whitehead Patent" and state whether or not you understand the same fully and the construction and operation of the tricycle device therein described, especially as to the second and third claims thereof.

A. I have examined the patent and fully understand it and its mechanism.

Q. 61. Please compare "Complainant's Exhibit Whitehead Patent" with "Complainant's Exhibit Defendant's Ideal Tri-
581 cycle" and state whether or not such tricycle contains the inventions or devices recited in the second and third claims

of said Whitehead patent, and give your reasons fully for your opinion.

(Objected to for reasons given above.)

A. I have examined the exhibits and made the comparisons herein referred to, and I do not find the devices described in the second claim, for the following reasons: The "Complainant's Exhibit Defendant's Ideal Tricycle" does not have any axle D *d;* does not have any bevel wheels E F. It does not have one or more bevel gears, G, applied to the master wheel H I *i i*, or any other bevel wheels or equivalents of bevel wheels. I do find some spur or straight-toothed wheels, and I do find an internal straight-toothed gear wheel, but neither of these are the equivalents of bevel gear, for a bevel wheel or its equivalent must be a device which transmits motion from one plane to another plane and turn on an axis at right angles or at some other angle to that of the wheel it is geared with. The spur gears which I do find are of two varieties, but their axis is in all cases parallel with the axis of the driving wheel and their direction of motion is in the same plane; consequently they cannot be the equivalents of beveled wheels, and I do not find the invention or devices set forth in the second claim of the Whitehead patent in this Ideal tricycle.

In the third claim of the said patent is described a master wheel having the bevel gear applied thereto, the wheels K L, and foot pedals *l l* in combination, substantially as described in the patent. For the reasons given in reference to claim 2, I do not find any bevel gear whatever or the equivalent of a bevel gear, and although I do find a sprocket toothed wheel corresponding somewhat to L,
582 I do not find any wheel K combined therewith. For the reasons I do not find the inventions set forth in the third claim in this Exhibit Defendant's Tricycle.

Q. 62. Do you know of any letters patent, either U. S. or foreign, prior in date of issuance to "Complainant's Exhibit Whitehead Patent," which fully describe and show the inventions and exact combination of devices of the second and third claims of this Whitehead patent? And, if so, please identify such patents by name, number, and date.

(Question objected to for reasons given above.)

A. I do. English letters patent to James Taylor, No. 2548 of 1885; to Geo. Hawksley, No. 2296 of 1861, and to Daniel Clark, No. 1728 of 1861.

(Defendant's counsel offers the patents referred to by the witness in evidence and requests that they be marked, respectively, Defendant's Exhibit Taylor English Patent, No. 2548; Defendant's Exhibit Hawksley English Patent, No. 2296, and Defendant's Exhibit Clark English Patent, No. 1728.)

(Objected to for reasons given above.)

Q. 63. Are you familiar with the different bicycle and tricycle

structures manufactured by the corporation complainant in this case?

A. I am.

Q. 64. Are any of the bicycle or tricyle structures manufactured by this complainant manufactured in accordance with any of the letters patent offered in evidence by the complainant as exhibits and which you have discussed in your deposition?

(Objected to for reasons given above.)

A. They are not, with the possible exception of one of the Wallace patents and the Kirkpatrick.

583 (Defendant's counsel here offers in evidence certified copy of file-wrapper and contents of "Complainant's Exhibit Latta Patent" and requests that it be so marked in this record.)

(Defendant's counsel offers in evidence certified copy of file-wrapper and contents of "Complainant's Exhibit Peters Patent" and requests that it be so marked in this record.)

(Defendant's counsel also offers in evidence certified copy file-wrapper and contents, "Complainant's Exhibit Veeder Patent," and requests that it may be so marked in this record.)

(Defendant's counsel also offers in evidence certified copy file-wrapper and contents, "Complainant's Exhibit Kirkpatrick Patent," and requests that it be so marked in this record.)

(Defendant's counsel also offers in evidence certified copy file-wrapper and contents, "Complainant's Exhibit Moran Patent," and requests that it be so marked in this record.)

(Objected to as immaterial.)

Q. 65. Have you read the paper or argument introduced in this record under the name and style of a deposition by Charles E. Pratt, Esq., the attorney for the corporation complainant herein?

A. I have.

Q. 66. Do you know Mr. Pratt; and, if so, how long have you known him?

A. I do; I have known him for three or four years.

Q. 67. Are you an officer or stockholder in the corporation defendant in this case; and, if so, when was that corporation formed and actively went into business?

584 A. I am. The corporation commenced business January 1, 1887. It was formed and went into business at the same time.

Q. 68. Were you in partnership with Mr. Gormully in the manufacture of bycles and tricycles prior to the formation of this corporation; and, if so, for how long a time?

A. I was; from May 1, 1884, to December 31, 1886.

Q. 69. During a portion of the time that you were a copartner with Mr. Gormully, as above, were you aware of the fact that Mr. Gormully was under license contract with the complainant herein, under certain letters patent, such contracts being in evidence in this case as Nos. 1, 2, and 3.

A. I was aware that some contracts existed, but I did not know all about their contents.

Q. 70. Were you aware, during the existence of your copartnership with Mr. Gormully, that he was paying out from the assets of the copartnership certain sums of money to the Pope Company as royalty under his personal license with that company?

A. I was.

Q. 71. Did you ever in any manner advise Mr. Gormully to enter into any license contract relations with the Pope Company or did you ever sanction or approve in any manner these personal contracts of license between Mr. Gormully and the complainant after their existence?

A. I did not. I always strongly objected, and advised him as well as I was able not to enter into any license or contract arrangement with complainants, and always objected to payment of royalties to the complainants for the use of patents which they allowed him to use but which he or the partnership did not use.

585 Q. 72. Have you ever, during the existence of the copartnership between Gormully and Jeffery or at any other time, acknowledged or acquiesced in, either verbally or otherwise, the validity of any letters patent appearing as complainant's exhibits in these several suits, or of any letters patent recited in any of the several contracts, 1, 2, and 3, between Mr. Gormully and the Pope Company? I will withdraw contract No. 1 from the question, as being made prior to your going into partnership with Mr. Gormully.

A. With the exception of Lallement patent, dated November 20, 1866, No. 59915, I have not acknowledged the validity of any of them. This Lallement patent is contained in the first and second contract only, not in the third.

Q. 73. Had not this Lallement patent expired before you entered into copartnership with Mr. Gormully?

A. It did expire before that time.

Q. 74. Have you ever in any manner, either verbally or otherwise, ever admitted or acquiesced in any statement that the bicycle or tricycle structures manufactured by yourself and Mr. Gormully or by yourself alone were manufactured under or in accordance with any claim or claims of any letters patent appearing as complainant's exhibits in these cases, or of any letters patent recited in contracts Nos. 1 and 2, with the possible exception of this long-expired Lallement patent?

A. I have not.

(Question and answer objected to because the evidences of admission exist in the written contracts and other documentary evidences and in the fact of payment of royalties by this witness, both individually and as a partner.)

586 Q. 75. The witness, Pratt, has attempted to give the impression on this record that the corporate existence of the Gormully and Jeffery Manufacturing Company was created for the purpose of escaping a possible embarrassment arising out of the as-

sertion upon the part of complainant that the personal license contracts still existed in part between Gormully and the complainant. Is there the slightest foundation in fact for this suggestion or assertion?

(Objected to as leading and calling for foundation conclusions.)

A. There is not.

Q. 76. Are you an officer in defendant corporation? And, if so, give your position and, if there is no objection, state what proportion of the stock you own.

A. I am secretary of the defendant corporation; also one of the directors, and I own 984 shares of stock in said corporation. The stock is in 2,000 shares, of which 984 are held by me.

Q. 77. How many men did the old firm of Gormully & Jeffery employ and how many does the present corporation employ?

A. Without consulting any memoranda, I believe that the old firm employed in the last year of its existence about 150 men. The new corporation employs about 250.

Q. 78. State whether or not the corporation defendant manufactures additional styles and different classes of bicycle and tricycle devices from those manufactured by the old firm of Gormully & Jeffery; and, if so, state generally in what these differences consist.

A. They do. They make bicyles of lighter construction
587 and higher grade and sold for a higher price than those made by the old firm. They also make a better grade of safety bicycle as well as make the same styles of bicycle made by the old firm. Those higher-grade machines referred to also contain improvements not employed by the old firm. The tricycles manufactured by the defendant are substantially like those made by the old firm and the Ideal bicycles, except that after the corporation was formed it was decided to change the color of those machines that we may afterward know at what time and by whom they were made.

Q. 79. Does the corporation defendant carry on its business at the same place where the business of Gormully & Jeffery was formerly conducted?

A. It does; but the office was moved January 1, 1887, into a new building erected continuous with the old building, and the corporation occupy both buildings.

Q. 80. Does the corporation employ new or different machinery in the manufacture of their bicycle and tricycle structures from that formerly employed by yourself and Mr. Gormully?

A. They do; the new building in which the office is placed was also supplied almost entirely with new machinery which was not owned by the old firm. There is a new engine, also, put into the new building to supply power to both.

Q. 81. Would the machinery or plant of the corporation defendant be of any value for any purpose whatever if the defendant corporation was estopped from the manufacture of bicycles and tricycles?

(Question objected to as immaterial and because there is no

prayer for an injunction to enjoin the manufacture of any other bicycles and tricycles than those these gentlemen have agreed
588 not to manufacture, and such devices as infringe complainant's patents, and also such machines as defendant Jeffery is now enjoined from making by the order of this court.)

A. It would not be of any value to manufacture, profitably, any other line of goods.

Q. 82. Have you examined so that you understand the same fully, and the several mechanisms therein shown and described, the letters patent identified by the eighth and ninth clauses of contract No. 3 and discussed in detail in the Pratt deposition in answer to question 12?

A. I have.

Q. 83. Have you those patents present with you?

A. I have all of them with the exception of the drawing of patent No. 87713.

(Defendant's counsel here offers in evidence the patents referred to by the witness and as identified by Mr. Pratt in answer to Q. 12, Hanlon reissue No. 3297, dated February 9, 1869, and original thereof, dated July 7, 1868, numbered 79654;
Irwin patent, No. 85527, dated January 5, 1869;
Hanlon patent, No. 86834, dated February 9, 1869;
Serrell patent, No. 87713, dated March 9, 1869;
Pickering patent, No. 88507, dated March 30, 1869;
Peters patent, No. 197,289, dated November 20, 1877;
Whitehead patent, No. 194,980, dated September 11, 1877;
Wallace patent, No. 249,278, dated November 8, 1881;
Wallace patent, No. 280,421, dated July 3, 1883;
Moran patent, No. 245,542, dated August 9, 1881;
Veeder patent, No. 252,280, dated January 10, 1882, and requests that they may be marked and identified by name, number, and date.)

Recess.

589 Q. 84. Have you yourself, personally, or did the firm of Gormully & Jeffery, during its existence, or has Mr. Gormully, personally, to your knowledge, ever manufactured any bicycles or tricycles in accordance with any of the letters patent just offered in evidence or which infringed any of the claims of any of said letters patent offered in evidence or identified by the eighth or ninth clauses of contract No. 3?

(Objected to for reasons given above.)

A. I have not, Mr. Gormully has not, the firm has not; neither nor does the defendant corporation.

Q. 85. Please compare each one of these patents last offered in evidence with each of the defendant's three bicycles in evidence and the single tricycle and explain to the court, briefly, why neither of the four defendant's machines in evidence infringe any of the claims of any of the patents.

A. I have compared them and find that the invention of Hanlon reissue 3297 is not found in either of the exhibits. Neither of the exhibits have the adjustable seat as described in second claim, and neither of them are constructed so that the two-wheeled velocipede can be converted into a three-wheel velocipede, or *vice versa*, as set forth in the first claim, and neither of them have the body of the velocipede substantially as described, formed of a bifurcated or forked bar or perch, as set forth, and neither of them have the driving cranks of a velocipede variable in the manner described in the Hanlon reissued patent. Therefore I do not find the invention of the Hanlon reissued patent in any of the complainant's exhibits defendant's bicycles.

I do not find any disk crank in combination with a velocipede wheel described in the first claim of the Irwin patent, or the wheel A constructed as described in the second claim of the Irwin patent, or the safety shield H as described in the third claim of the Irwin patent. Therefore I do not find any of the early inventions in the defendants' bicycles.

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I do not find any shield interposed between the periphery of the forward wheel and the perch secured to the axle by means of braces *s s*, substantially as described in the first claim of Hanlon, No. 86834, nor do I find the brake mechanism combined with the handle of the velocipede, as and for the purpose described in claim 2 of the same Hanlon patent, nor do I find in combination with the perch and swiveling frame the means for stopping or limiting the extent of motion of the latter, substantially as and for the purpose set forth by Hanlon, No. 86834, third claim. Therefore I do not find any invention of Hanlon as described in any of the defendants' bicycles or tricycle.

I do not find in the defendants' bicycles a pair of wheels mounted on an axle and bolt, substantially as specified, so that the swinging of the axle and the inclination of the vehicle are simultaneous, as described in the first claim of the Serrell patent, 87713, and I do not find the forwardly inclined bolt, axle, and wheels in combination with the wheel *a* described in the second claim of the same Serrell patent, or the perch or frame connected with the inclined bearings for the bolt *d*, extending through the axle of the wheel, as described in the third claim of the same Serrell patent, or a single driving wheel fitted with an axle that is eccentric, as described in the fourth claim of the said Serrell patent, nor the contractile ring of round rubber introduced into the rounded groove in the periphery of a wheel, as described in the fifth claim of the said Serrell patent. Therefore I do not find the inventions of Serrell in any of those defendants' bicycles, and I do not find the reach or backbone constructed of a central or main tube, A, and lateral rear tube A′ A′, as described in the first claim of the Pickering patent, 88507, nor the combinations of the sockets B and D with the reach constructed of tubes A A^1 A′ constructed as described in the second claim of the Pickering patent, nor do I find in combination with the socket B the fork C, composed of tubes con-

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structed to form oil-boxes at their base, as described in the third claim of the said Pickering patent.

I do not find the stirrups H made of polygonal shape in a transverse section and hung to freely turn on the wrist-pin of the cranks which carry them, substantially as shown in the Pickering patent, claim 4. For the above reasons I do not find in the defendants' bicycles any of the inventions of Pickering.

I have, in my previous testimony, given my reasons for not finding any of the inventions of the Peters or Whitehead patents in the defendants' bicycles or tricycle exhibited by complainant. For the reasons given in my earlier testimony I am unable to find the inventions of Wallace, Moran, or Veeder in these defendants' bicycles and tricycle.

Q. 86. I notice that in the defendants' bicycles and tricycle there is a rubber ring inserted in a groove of the wheel forming the tread of the wheel. What reasons, state particularly, why this device does not come under the fifth claim of the said Serrell patent?

A. Because the ring of rubber in the periphery of the wheel is not introduced in the manner described and secured by nails or other fastenings passing through the rubber. It does not
592 have any fastenings or any mode of securing the rubber in the periphery of the wheel, which prevents the velocipede slipping when at an inclination. The mode of fastening, as I understand it, with the nails passing through the rubber forms an important feature of this invention, for the inventor states: "I am aware that India rubber has been employed for the tires of wheels and that the same has been introduced into a dovetailed groove in the periphery of the wheel." For these reasons, in my opinion, the tire shown in defendants' bicycles and tricycle is not covered by claim 5 of the Serrell patent.

Q. 87. In the application of your rubber tire to the periphery of your velocipede wheels does the "contractile" element of your rubber tire form any part in holding the tire in place upon the wheel, and by what means do you hold such rubber tire in place?

A. The "contractile" character of rubber is used to a very slight extent; sometimes not used at all. The tires are held by the adhesive cement which we apply to the rim for applying the tire and by the heating which both the tire, cement, and rim are subjected to after the tire is put on. The tire, after it is on the wheel, is made to roll in a machine which compresses the tire at its outer surface into the rim and makes it adhere to the cement and edge of the rim sideways by the effort of the rubber to expand, and this expansive tendency is of quite as much or more effect than the contractile quality of the rubber.

Q. 88. With your manner of cementing your rubber tire to the periphery of the wheel is there any necessity that your tire should be an endless band or contractile ring and applied to the wheel as such, as provided for in this Serrell patent?

593 A. No absolute necessity. It is convenient for us to do so, for the tires are sold to us in endless bands as a common article of manufacture, and we have been accustomed to use this kind

of a tire; but another large manufacturer in the United States, the Overman Wheel Company, make a meritorious feature in their bicycles of an absolutely non-contractile tire—that is, one considerably larger than the rim and cemented, as I have previously described. This tire used by the Overman Company is an endless band of the same character as that shown on the defendants' bicycles.

Q. 89. I see by the Serrell patent, fifth claim, that the endless band must be of round rubber. Have the individual defendants in these suits used round rubber exclusively or is round rubber essential as a form to the construction of rubber tires?

A. The firm of Gormully & Jeffery did make a large number of bicycles with the rubber tire hollowed on its outer surface, but the firm found that this form of tire cost more money than the round tire and afterwards discontinued its use.

Q. 90. I see by the fifth claim of the Serrell patent that it makes as an element of the claim the introduction of the round rubber into the rounded groove, as provided for in the patent, and that the manner provided for in the patent is by the contraction of the contractile ring or by nails or other fastenings passing through the rubber and thus retain its place. Did the complainant itself ever introduce and apply its rubber tire in the manner provided for by this claim, to your knowledge?

A. Not to my knowledge with any fastening passing through the rubber?

594 Q. 91. At the date of this Serrell patent, as far as shown by that patent in its fifth claim, was there anything left for Serrell to invent except this contractile ring introduced into his tire in the manner specified in his patent and identified in the fifth claim?

A. I do not think that there was. Rubber tires were old, and round rubber bands capable of contracting or expanding were used on the periphery of wheels in rounded grooves and used to my knowledge in the bobbin-winders of sewing-machines without any nails or other fastenings passing through the rubber long prior to the date of the Serrell patent; but when those same bands are made to go on wheels of large diameter, like bicycle wheels, they require some fastening besides the contractile action of the rubber. Therefore the nails or other fastenings passing through the rubber is the only feature that he could invent.

Q. 92. I pick up the patent exhibit here of Hanlon, dated July 7, 1868, and numbered 79654, and see that Hanlon there states that the wheels of the velocipede "may have rubber rings around the tire to make them noiseless and prevent them from slipping," but did not deem the construction described of importance enough to claim. Can you point out by number and date any other patents long prior to Serrell which clearly provided for the rubber tire of Serrell aside from its manner of introduction into a groove and retainment, as provided for in the fifth claim?

(Question objected to for reasons given above, and for the further reason that the witness individually and as a member of the firm

paid royalties under this patent and was enjoined individually from making such structures, and it is therefore now incompetent for him to deny the validity of the patent.)

595 A. The English patent 6027, 1830, to Bramley & Parker, describes a rubber tire for a wheeled vehicle, but does not describe particularly how it is secured.

Q. 93. I will ask you to examine and compare the four claims of the Hanlon reissue, No. 3297, with the four claims of the Hanlon original, No. 79654, and ask you if it is not a fact that each of said four claims are bodily new and are formed by the elimination of several elements respectively constituting the bare, bald combination claims of the original patent.

(Question objected to as leading and immaterial; also because it contains statements which are conclusions of counsel and asks the witness to swear to them.)

A. I have compared the original with the reissued patent mentioned, and I find the first claim of the reissue—the fourth claim of the original—broadened by leaving out the adjustable seat as one of the elements and the extension cranks as one of the elements and the bifurcated perch as one of the elements. The claim 2 of the reissue is broadened by leaving out the reference to what part of the spring it is fastened and by leaving out the words describing what it is adjustable on which appears in the first claim of the original patent. The claim 3 is the claim 2 of the original; is broadened by leaving out a reference to the front axle and by leaving out the purpose of making the velocipede adjustable. The claim 4 is the claim 3 of the original by leaving out a reference to the two wheels H H and leaving out the words "providing the perch or connecting rod with a forked rear end," and for other reasons. I find the reissue to be formed by the elimination of elements of the original patent.

596 Q. 94. Without attempting to burden this record with the long list of prior patents existing prior to each of the exhibits last offered in evidence, but relating to the same subject-matter, I will ask you if it is not a fact that these prior patents show substantially the inventions and devices of the patents offered in evidence to the extent, at least, of restricting each patent exhibit to the specific elements therein described and claimed, as, for example, in the manner illustrated in and by your testimony in relation to the fifth claim of the Serrell patent and others.

(Objected to for reasons given above.)

A. It is a fact, as I understand it.

(Defendants' counsel here gives notice that for the purpose of showing the manner and methods of this corporation compiainant in their attempts to repress an open industry and monopolize a trade common to the whole country he will, at the hearing of this case, for the above reasons offer in evidence and show to the court a

Patent Office copy of each and every letters patent recited in the opening page of contracts 2 and 3.)

Adjourned to Thursday, August 25, 1887, at 10 o'clock a. m.

THURSDAY, *August* 25, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

Cross-examination by L. L. COBURN, Esq. :

C. Q. 1. You say you commenced making small velocipedes in 1869. Did you take a license after that from The Pope Manufacturing Company, the complainant?

597 A. I repaired and rode them in '69. At that time there was no demand for royalty that I am aware of. Eleven years after that time I took a license.

C. Q. 2. I should have said 1879 instead of 1869 as the time you said you commenced making velocipedes. When was it you took your license; what year?

A. In 1880.

C. Q. 3. What patents were named in that license, and what were the sizes and kinds of velocipedes you were licensed to make?

A. Reissue, S. W. Smith, No. 3319; the subject I do not recollect; I think it was some sort of a toy rocking horse;

P. W. McKenzie, No. 33349; that was for some kind of a child's velocipede, running on three or four wheels;

P. W. McKenzie, No. 41310; a combined figure of a horse and three wheels, forming a velocipede;

Reissue, Montpelier Manufacturing Company, No. 7818; the subject-matter I cannot now recollect; 'twas a patent, however, which I never used;

Harvey A. Reynolds, No. 46705; for another toy horse, mounted on four wheels;

Harvey A. Reynolds, No. 80245; that I don't recollect the subject of, but it was something I never used;

Calvin Witty, No. 87999;

Pierre Lallement, No. 59195;

Reissue, Richardson & McKee, No. 7972;

Reissue, Harvey A. Reynolds, No. 8252; another toy horse.

Those were all the patents which I was licensed under. I was licensed to make velocipedes having wheels of forty-two inches and under, to be made without rubber ti-es.

598 C. Q. 4. How long did you pay royalties under this license?

A. About three years or a little less.

C. Q. 5. Was there a complaint that you violated the terms and conditions of the license?

A. Yes; there was.

C. Q. 6. And a suit brought against you by the Pope Manufacturing Company for a breach of the contract, wasn't there?

A. There was. The Pope Manufacturing Company won that suit, and I was charged about $150 for damages, which they claimed to

have sustained, and an injunction was also issued compelling me to refrain from doing anything outside of the contract as long as that contract was in force. I paid every cent required and refrained from manufacturing bicycles except in accordance with contract while it was in existence.

C. Q. 7. That the court may know that you are an impartial and unprejudiced witness, will you please answer my question without an attempt to justify your conduct while you have been sued either in this or in other suits? I call your attention to the fact that I didn't ask you in the last question whether there was an injunction issued in that suit, what the injunction was for, whether you violated the injunction, whether you paid royalties on rubber-tire machines which you made in violation of your contract; but I will now ask you when you first knew Mr. Gormully.

(Defendants' counsel objects to the lecturing of the witness as the prelude to the asking of a question.)

A. I do not know exactly. I think between thirty and thirty-five years ago.

C. Q. 8. When did you commence working for him?

599 A. I don't know the exact date. It was about the time the first license was made between him and the Pope Manufacturing Company.

C. Q. 9. Did you commence working for him then at your shop or his shop?

A. At my shop.

C. Q. 10. What was his business then at his shop?

A. Manufacturing iron-work for buildings.

C. Q. 11. Sheet iron cornices, etc.?

A. Yes.

C. Q. 12. Where was his shop then, and where was your shop?

A. His shop was 228 Michigan street; my shop was 40 South Canal street.

C. Q. 13. How long after the injunction issued against you was it before you commenced working for Gormully at your shop?

A. It was a long time before the injunction issued that I commenced working for Mr. Gormully.

C. Q. 14. Was it during the pendency of the suit against you?

A. If was.

C. Q. 15. Was it not after an injunction had issued against you in that suit brought by the Pope Manufacturing Company?

A. It was not.

C. Q. 16. Don't you know there was a preliminary injunction issued by the court during the pendency of the suit and before the final injunction was issued?

A. I do not. A motion was applied for by the complainants, and my recollection is that such motion was denied.

600 C. Q. 17. Your recollection is, then, that you were not under an injunction when you went to work for Mr. Gormully making velocipedes, is it?

A. I am quite sure I was not, for I should be very careful not to do what the court enjoined me from doing.

C. Q. 18. Did you sell all your velocipede stock to Gormully at the time you went to work for him in the spring of 1883?

A. I did sell all such stock, but the time was somewhat earlier. It was in the fall of the year, and must have been a few months previous to that time.

C. Q. 19. I see his first license was dated the 13th of June, 1883. You think you sold him your velocipede stock and went to work for him in the fall of '82, do you? I will remind you that you stated above that you thought it was about the time he took his first license.

A. You are correct in your statement, and I see no reason to change my former answer except in this, that I find I went to work for him in the fall of 1882, and the license to him is dated June 13, 1883.

C. Q. 20. Who sold the velocipedes that you made for him; did you?

A. I did not; he sold them himself.

C. Q. 21. You didn't sell any at the factory where you made them, did you?

A. It is possible that I did, one or two, but the business was conducted largely through agents and correspondence, which Mr. Gormully attended to, and which I did not.

C. Q. 22. When did he give up his cornice business?

A. In about the year 1884 or '5.

C. Q. 23. Did not the same agents that you had selling velocipedes continue to act after you sold your velocipede stock to and went to work for Gormully making velocipedes?

601 A. A few of them did, and a large number of others were established that I did not know before.

C. Q. 24. You continued to make for Mr. Gormully while you worked for him the kind of velocipedes that the Pope Company had sued you for making before you sold your stock to Gormully and went to work for him, didn't you?

A. I continued to make the same stock I made before—that is, the prohibited goods—as an employé.

C. Q. 25. Your business went on in that way until your partnership was formed, did it?

A. It did.

C. Q. 26. When was that?

A. May 1st, 1884.

C. Q. 27. When did the final injunction issue against you in the suit the Pope Company had against you, as near as you can recollect?

A. December 11, 1885.

C. Q. 28. Did you discontinue making the prohibited goods as a partner after the final injunction issued, or did you continue as before?

A. I continued as before.

C. Q. 29. You continued, ostensibly, making under and by virtue of Mr. Gormully's licenses, didn't you?

(Objected to as not calling for a fact but for a conclusion.)

A. I did while the contract I was enjoined under was in force.

C. Q. 30. Did you stop manufacturing as Gormully's partner and under Gormully's licenses when you considered that your personal license contract which you had violated terminated?

602 (Objected to because the testimony shows that the witness never manufactured under Gormully's licenses.)

A. I did not stop manufacturing. I strongly objected to paying any license fees for patents we were not using.

C. Q. 31. I did not ask about your objections. I will now ask you whether at the time the injunction issued against you you were making velocipedes or bicycles with rubber tires, whose wheels were of a greater diameter that forty-two inches.

A. Yes, sir; I was engaged in making a large number of them.

C. Q. 32. And those were prohibited under your contract and your injunction, were they not? And you continued to make them under and by virtue of these Gormully licenses and paid royalties therefor to the Pope Manufacturing Company, and on that account did not discontinue their manufacture? Isn't that correct?

(Defendants' counsel objects to this question as calling for secondary evidence, the contract itself and the injunction being the best evidence. Defendants' counsel further objects to this and all testimony bearing upon the question whether witness has violated the injunction of the court, and respectfully calls the attention of the learned counsel for the complainant to the fact that it would be impossible for this witness, while under injunction, to recognize and manufacture any bicycle or tricycle structure under any license held by Mr. Gormully, when such recognition and manufacture would be a violation of the injunction, and defendants' counsel suggests that if any violation of an injunction has occurred it is the duty of the complainant to present this fact to the court
603 and not attempt to intimidate the witness and use an alleged violation of an order of a Federal court as a commercial commodity in enforcing their schemes in connection with their system of contracts and patents which appear in this case.)

(The counsel for complainant withdraws the question for the purpose of relieving the witness from answering it, under the instruction of his counsel, with reference to what it would be possible for him to do.)

C. Q. 33. Did you personally remit license fees as royalties under the Gormully licenses to the Pope Manufacturing Company in the absence of Mr. Gormully?

A. Yes; I think I did.

C. Q. 34. Did you remit them under a written protest accompanying the royalties, or did you remit them in the regular due course of business?

A. Not quite in the due course of business, but as money that the firm was compelled to pay.

C. Q. 35. How long did you continue to pay these royalties—till about what time, as near as you can recollect?

A. Till about July, 1886.

C. Q. 36. When did you commence making the new and different styles and kinds of bicycles that the Pope Company complained of as being in violation of these Gormully license contracts?

A. I can't answer that question by giving one date. I think there are a number of complaints, and the grades of bicycles have been improved in one respect or another many times since the first contract was made.

C. Q. 37. When did you commence making the "American Champion" bicycle?

604 A. I commenced making—or the firm commenced making—in the spring of 1886.

C. Q. 38. Prior to that time you had been making what was known on the market as the "Ideal" and the "Challenge," had you not?

A. Yes.

C. Q. 39. What was the difference in price between those and the "American Champion"? Which was the higher grade machine?

A. About 15 per cent. difference. The Champion was the highest grade.

C. Q. 40. What made it higher priced and a higher grade machine?

A. It had hollow handle bars, hollow forks, a better rubber tire, and some other improvements, besides having ball bearings to both the wheels and pedals.

C. Q. 41. When did you commence making the American Light Champion?

A. In the spring of 1887.

C. Q. 42. How does that compare in price and grade with the "Ideal" and "Challenge" that you had been making?

A. The price is about twenty-five per cent. more than the "Challenge." The prices given by me are stated from judgment rather than from actual figures, which are published in the defendant company's catalogue. I am not exact, I know, for I had very little to do with selling the goods. The grade is better than in the "Challenge" and "Ideal."

C. Q. 43. What is the difference between them which causes the higher price and grade?

A. They are made more carefully and have the latest improvements, whereas the "Champion" is not so much improved.

605 C. Q. 44. How do the "American Champion" and "American Light Champion" compare in price and grade with the complainant company's "Standard Columbia" bicycle?

A. They are a higher price and better grade, we think. We think they are a little better. We know they are.

Recess.

C. Q. 45. The "American Light Champion" is like the "American Champion" as to having hollow handle bars, hollow forks, and ball

bearings to both of the wheels and pedals, and in those respects differ from the "Ideal" and "Challenge" that you had been making, is it not?

A. They differ in the above respects from the "Ideal" and "Challenge," but both these latter machines were made with ball bearings to the front wheel and pedals, and sometimes to the rear wheel.

C. Q. 46. Do not the pedals of the "American Champion" and "American Light Champion" differ from the pedals of the "Ideal" and "Challenge," as shown in these exhibits, "Complainant's Exhibit Defendant's Ideal Bicycle," and exhibits "American Champion" and "American Light Champion"?

A. They do.

C. Q. 47. Has this "Complainant's Exhibit Defendant's Ideal Bicycle" ball bearings for either the front or rear wheel or the pedals?

A. It has not.

C. Q. 48. Doesn't that correctly represent the way you made the bearings of the "Ideal" and "Challenge" bicycles prior to the spring of 1886, so far as ball bearings are concerned?

606 A. No; it represents the plain bearing style of "Ideal" and "Challenge," but it does not represent the ball-bearing style of "Ideal" and "Challenge" bicycles which we made before that time.

C. Q. 49. How many "Ideal" and "Challenge" bicycles did you make before then having ball bearings for either the front or rear wheels or pedals, and how many having ball bearings for either or all the bearings above named?

A. I do not recollect, and I have no means of knowing the number; but the firm made and sold and advertised them in the year 1885; sold some of them, I think, to the Pope Manufacturing Company at about that time.

C. Q. 50. What is the difference, if any, between the ball bearings in your "American Champion" and the "American Light Champion" and the complainant's "Expert Columbia" and the "Æolus pedal," named in the license contract No. 3?

A. I do not know what the "Æolus pedal" referred to in that contract is, and do not recollect what style of ball bearing was used in the "Expert Columbia" bicycle at that time.

C. Q. 51. You know the construction of the ball bearings of complainant's "Expert Columbia" and "Columbia Light Roadster," do you not; and, if you do, how long have you known it?

A. I do not know exactly how they are constructed. I have never taken one apart.

C. Q. 52. You stated in your direct examination, did you not, that you were familiar with the construction of the complainant's machines, and gave your opinion as to whether they used their own patents in their construction? If you did, how do you harmonize it with your present statement?

607 A. I stated they did not use the Peters patent from a knowledge that there is no room for the rollers described in it and because they would not operate in a bicycle construction, and

I have seen engravings of two or three styles of ball bearings in the catalogue of the complainant company which shows what I understand they use.

C. Q. 53. Then, so far as you know, the ball bearings in the "American Champion" and the "American Light Champion" are precisely like the ball bearings in the "Expert" bicycle and "Victor" tricycle and in the "Æolus" ball pedals named in contract Exhibit No. 3, are they?

A. No; they are not like the engravings shown of the bearings of the "Expert Columbia" or of the "Victor" tricycle.

C. Q. 54. Direct question 63 asks you whether you "are familiar with the different bicycle and tricycle structures manufactured by the corporation complainant in this case." Your answer was, "I am." You meant, did you, that you had seen cuts which you supposed to be cuts of those structures?

A. Yes; cuts published by the complainant and also the machines made by complainants, but I have never taken one of their "Expert" bicycle bearings apart.

C. Q. 55. You say that it is your opinion that there is a difference between the ball bearings of the structures named in the license contract No. 3 and the ball bearings in the machines made by you. Will you describe that difference, as you understand it? I mean the difference between the ball bearings of said "Expert" bicycle and "Victor" tricycle and the "Æolus" ball pedal named in the contract, and the ball bearings in the "American Champion" and "American Light Champion."

608 A. I don't know what the "Æolus" pedals named in the contract are, because I have seen several varieties of pedals marked "Æolus." The bearings of the "Victor" tricycle that I have seen have been made with an outside division of the ball chamber. The "Expert Columbia" ball bearings, to the best of my knowledge, have been made with the ball chamber divided on the inside. The "American Champion" and "American Light Champion" wheels are made with the inside of the ball case divided.

C. Q. 56. Then, as you understand it, the "Expert Columbia" bearings are like the bearings of the "American Champion" and "American Light Champion," are they, in that respect? And, if there are any differences that you know of, please name them.

A. In regard to the inside division of the ball-bearing chamber they are the same; but in regard to the means provided for adjusting those divisions, and which constitutes the principal difference in all ball bearings, except, as I said before, the division of the ball chamber, they are entirely different. In this matter, as I understand it, we are describing the main wheels of those bicycles and tricycles.

C. Q. 57. Please describe the difference in adjustment of these bearings. I mean the difference between the means of adjustment you have spoken of in the "Expert Columbia" and in the "American Champion" and "American Light Champion."

A. The bearings of the "American Champion" and "American Light Champion" have one fixed cone sleeve and one movable

cone sleeve. The bearings of the "Expert," I believe, have the same.

609 The movable cone sleeves of the "American Champion" and "American Light Champion" are moved by a nut which forces the adjustable sleeve to the non-adjustable without revolving it and without being able to withdraw it, and the adjustable cone of the "Expert" is moved by turning inside of a nut which, I believe, is fast to the piece the first sleeve is on, and the movable sleeve made to rotate in some manner, and by such rotation in the fixed nut can be moved nearer and farther from the balls and fixed cone.

C. Q. 58. What is the difference, if any, between the ball bearings of the rear wheel and pedals of the "Expert Columbia" and the ball bearings of the rear wheels and pedals of the "American Champion" and the "American Light Champion"?

A. I do not know of any substantial difference.

C. Q. 59. Did you not know at the time you took your license of the Pope Manufacturing Company, in 1880, that there were other parties in Chicago that then had licenses and were manufacturing under licenses taken from the Pope Company?

A. Yes; I understood that there was.

C. Q. 60. Did you not know that Gormully had a license at the time you worked for him making up the tricycle stock which you sold him?

A. I knew he had a license during that time or a part of that time.

C. Q. 61. Do you know the date of the license contract No. 3, and whether he had that contract at the time you and Gormully formed your copartnership?

A. The contract No. 3 is dated December 1, '84. The partnership was entered into May 1, '84.

C. Q. 62. Then you manufactured from May to December under the license contract No. 2, making the kinds and styles of machines therein described, did you not?

610 A. I never manufactured anything in regard to the contract, because, although I had seen it, I made no memoranda of its contents. I only made the goods listed on the firm's catalogues, and that was my principal guide in manufacturing.

C. Q. 63. What additional privileges were secured to the firm, as you understand it, by the contract No. 3 that you did not have under the contract No. 2, and what different kinds or sizes of machines did you commence to make after December, 1884, which you had not made before?

A. I do not know that the contract gave any privilege to the firm. I know that the firm paid large sums of money monthly to Gormully, who, I understand, paid it over to the complainants, but I am not aware that the firm had any privileges they did not enjoy before or without paying the monthly sums of money. The firm's catalogue of the spring of 1885 will show clearly what the firm made in that year of 1885. I think that the firm made nearly all the goods described there.

C. Q. 64. Can't you remember whether you made larger bicycles in '85 than you did in '84, and won't you tell?

A. I cannot tell from recollection of years, but it is very likely we did. The catalogue shows what we did make.

C. Q. 65. Did you have a copartnership agreement in writing with Gormully?

A. I did.

C. Q. 66. Did you know that there was an agreement in that license contract under which you were manufacturing at the time the injunction issued against you whereby it was agreed that
611 these ball bearings such as were in the "Expert Columbia" were covered by the Peters patent, and that you would not make such ball bearings, and in case you did the complainant company might obtain an injunction either under the contract or under the patent without notice?

A. The contracts were made to Gormully, were held by him always, and interpreted by him, and my only knowledge of the nature of the contracts was Gormully's version of them and interpretation of them. They were—all those that I saw were—worded in such a way that I could not understand them without Gormully's assistance in the time I had a chance to look at them, and I did not know of any such agreement.

C. Q. 67. Had you known of it would you have manufactured them?

A. If I had known that the firm was in danger of an injunction or that individually I was in danger of an injunction, the firm or myself would not have manufactured them.

C. Q. 68. You left the matter of what you were to manufacture entirely to Gormully, did you, because he held the contracts in his name, and you relied upon him for their construction?

A. Well, that is hardly the way the thing was done. I was constantly urging and advocating the manufacture of larger and better bicycles than the firm was making.

C. Q. 69. You were not advocating that while the injunction was in force against you, were you?

A. Yes; I was.

C. Q. 70. In violation of the injunction and Gormully's agreement, both, do you mean?

A. Not in violation of any injunction, but regardless of
612 what agreement or license then existing between Gormully and the complainant, if such manufacture would violate them.

C. Q. 71. You had worked around one injunction through Mr. Gormully and were willing to try another by violating the Gormully agreement, were you? Is that what you mean?

A. No; I do not mean that I ever worked around any injunction. I took great pains to obey the injunction against myself, but Gormully's contract was his own particular matter. I never had a particle of interest in it or any of them; never sanctioned it or any of them, and always cautioned him as well as I could to take great care and not be tangled up with them as I had been.

C. Q. 72. You mean, do you, that you advised him not to violate them as you had yours and get tangled by an injunction as you had, or do you mean that you advised him not to take any licenses at all? If the latter is what you mean please explain how you would have managed to have kept on manufacturing the prohibited goods under the injunction which you say you continued to make in connection with Gormully under his licenses.

(Defendants' counsel objects to the above as being a mixture of the statement of counsel and an assumption of fact which does not exist and ending with a compound question, not cross-examination, and wholly irrelevant and immaterial.)

A. I was never tangled by any injunction. The injunction was very clear and a direct order, which I understood and kept strictly. This injunction lasted on me only about a year of the whole time, and during that time the bicycles I assisted in making were made
613 with the consent, as I understood it, of the Pope Manufacturing Company. When the contract I was enjoined under expired by limitation I was free or considered myself so to make any style or kind of bicycle not covered by certain minor patents, and in that way I should have kept on manufacturing.

C. Q. 73. Please explain in what way you were manufacturing the prohibited structures during the year which you considered the injunction to be in force by the consent of the Pope Manufacturing Company, unless it was under the Gormully licenses that you have said once you manufactured under and therefore did not stop when the injunction issued, and now, since adjournment, say that you "never had a particle of interest in it or any of them"—referring to the Gormully licenses.

A. I never had a particle of interest in any of the licenses in any shape or manner, but I understood and believed and still believe that the Pope Manufacturing Company were well pleased to receive a large amount of money that they were getting from the firm, and that money was sufficient to pay for the privilege of not being molested in our business.

Adjourned to Friday, August 26, 1887, at 10 o'clock a. m.

FRIDAY, *August* 26, 1887—10 o'clock a. m.

Met pursuant to adjournment.
Present: Same as before.

C. Q. 74. If I remember correctly, you stated in your direct examination that you manufacture the ball bearings in the "American Champion" and "American Light Champion" under the J. Smith patent, No. 197,421, of 1877. Is that what you claim?

A. The ball bearings of the rear wheel of both those machines are made in accordance with that patent.

614 C. Q. 75. Do the bearings of the rear wheels of those exhibit bicycles have grooved collars in which the balls roll or do they have two oppositely inclined conical bearings?

A. They do have grooved collars, one fixed and the other movable.

C. Q. 76. They don't have the conical bearings, do they?

A. They do not. The groove is a curve nearly fitting the balls, but one edge of the groove is of greater diameter than the other edge of the groove, and a line drawn from each edge of the groove will show clearly its grooved character.

C. Q. 77. Then in this respect you make them different from the bearings of the rear wheel of the "Expert Columbia," do you—that is, you have two grooved collars instead of two oppositely inclined conical bearings, do you?

(Defendants' counsel objects to this interrogatory as not cross-examination, as incompetent and irrelevant, and suggests that it will be time enough to try the case of these defendants against the complainants on the Smith patent when we get to it.)

A. The bearings of the "Expert" or some of the "Columbia" rear wheels were made with beveled surfaces, and they might have been made and may be made at this time with grooved surfaces. I am not sure what the "Columbia" people are making at this time.

C. Q. 78. Does this model that I now show you correctly represent the ball bearings of the rear wheels of the bicycles you have been making, and does this differ from the ball bearings of the rear wheels of the "American Champion" and "American Light Champion"? If it does, in what respect?

615 A. With the balls which form part of the bearings it does represent the same—that is, the ball bearings of the "Champion" and "American Light Champion."

C. Q. 79. Will you point out to the court the fixed, stationary grooved collar on the axle of that bearing and explain how it differs from the conical bearing on the axle in the Peters patent?

(Defendants' counsel states that the model concerning which the witness is being interrogated is the private property of the defendants and is in no manner an exhibit or referred to in this case; that it was in no manner called to the attention of complainants' counsel nor handed to him for any purpose in this case, but was simply an article that happened to be in the room and was picked up by him, and defendants' counsel refuses to turn this model over to the complainants in this case or permit it to be taken by complainants and used for any purpose whatever.)

A. The fixed collar is that enlarged part of the axle having a grooved face presented towards the longest end, and it differs from the beveled or notched collar in the Peters patent in being curved to fit the wearing or rolling surfaces and support the wheel, while in the beveled or notched shoulder described in the Peters patent the beveled ends of the rollers are not their bearing parts, and the beveled shoulder is used or supposed to be used to keep the roller bearings from moving endways, but these shoulders are not used to support the weight and support the wheel at the extreme ends of the hub.

C. Q. 80. Have you had here in this room or in this building any other model of the ball bearing of the rear wheels of your
616 "American Champion" and "American Light Champion" open so that you could examine the bearings of the balls and see the internal construction of those rear-wheel bearings excepting this model that I have just showed you? Is it not a fact that the two velocipede exhibits that you have talked about are somewhere outside of this room still boxed in the condition in which they were shipped from the East, and are you willing to allow the use of this model, which is a small detached hub with one bearing cut in section, which you say correctly represents the ball bearing of the rear wheels of those exhibits and has been convenient for reference and use while taking this testimony and would be equally convenient for the court to use in understanding such ball bearing, as it has simply the axle, two cones, and bearing box showing just the parts in question? If you are not willing to have it used will you state your reasons why.

(Defendants' counsel, not admitting but repudiating the assertions made in the question, instructs the witness to decline to permit a personal and private model obtained in the manner in which this model was obtained to be offered in evidence by the complainants in this case or to permit the complainant to pick up and use as his evidence or for any purpose whatever any private property of these defendants; and defendants' counsel suggests that it would be ample time for the complainant to utilize and appropriate the private property or models of these defendants when they are given them for so doing.)

A. I have not. One is within twelve and one is within thirty feet and owned and controlled by the complainants' counsel.
617 The model in question is the only one that I have, and was intended as an exhibit in court in another suit now pending. Therefore, and with the advice of defendants' counsel, I refuse to have this model used by the complainants as an exhibit or any other way at this time.

C. Q. 81. The counsel asking the questions picked up this model from the table where there were several of your models, did he not?

A. I think not.

C. Q. 82. Where did he get it, do you think?

A. I do not know. I left it in or near a box containing the defendants' private papers.

C. Q. 83. Don't you know that you are trying to prevaricate now, and don't you remember you have sworn to tell the truth?

(Objected to as insulting to the witness.)

A. (The witness refuses to answer any questions which imply a manifest insult.)

C. Q. 84. Don't you know that I haven't gotten up from this chair since I began to ask you questions this morning, and that

you are sitting within a few feet of me, facing me, and have been ever since I commenced asking questions this morning?

A. The witness admits this, but the counsel asking questions had ample opportunity to place that model in his pocket before adjournment, and as I did not see that model between the time of adjournment and the time he produced it as an illustration it is quite likely that he did.

C. Q. 85. You are willing to swear, are you, that you are of the opinion that I took that model last night after adjournment, carried it in my pocket, and produced it therefrom this morning when I asked the question about it, instead of taking it from the
618 table beside me, where there are several of your small models and exhibits? And has not that ball-bearing model been lying around the room here just as common as the others during the entire time you have been testifying?

A. I cannot form an opinion about that matter, for the last time I saw it before it was in the counsel's hands was as I have stated, and its production by him looks a little suspicious. I did not know and did not see the model laying on the table to-day, as complainant's counsel states he did.

(Defendants' counsel states that if it is of the slightest importance as to the exact point and locality that this model was picked up by complainant's counsel, and is so considered by complainant's counsel, complainant's counsel is respectfully requested, if he so desires, to locate such point by a statement on the record, and such statement will be unhesitatingly admitted as a fact, and complainant's counsel is requested to proceed with a legitimate cross-examination of this witness.)

C. Q. 85. How far are you from the table on which the models lie?

A. About three and one-half feet.

C. Q. 86. You are sitting facing it, are you not, and have been during this session, looking directly towards it?

A. Sitting in the same direction all the session, but not looking at the table all the time.

C. Q. 87. The model might have been there, in your opinion, and I have taken it from there from among the other models without your seeing it?

A. Yes; it is possible.

C. Q. 88. You don't think it probable, however, do you?
619 A. No; I do not.

C. Q. 89. Where is the model now? What have you done with it?

(Defendants' counsel states that he has taken the model and has placed it where complainant's counsel will not get hold of it again.)

A. I do not know. The answer of defendants' counsel is all the information I have about its place. I have done nothing with it.

C. Q. 90. You made this model, did you not?

A. It was made under my instruction.

C. Q. 91. You say it's the only model you have had representing these rear-wheel bearings during this examination, don't you?

A. As used on the "American Champion" and "American Light Champion," I do.

(Counsel for complainant gives notice that he shall ask the court to order that such model be produced at the hearing of this cause because it is a model used by defendants in examining their expert witness in direct examination, and requests the defendants' counsel to produce the same for use on cross-examination of this witness.)

(Defendants' counsel states that the record shows that the model was not used or referred to on the direct examination, and that the testimony does show on the cross-examination that the model is the private property of the defendants, upon which the complainant has not the slighest claim or demand. Defendants' counsel refuses to pass over the defendants' property to complainant's counsel, but will cheerfully attend upon any motion made before the court to the effect indicated in the last effort of complainant's counsel.)

620 C. Q. 92. Do you understand "Defendant's Exhibit Allcott Patent," concerning which you have testified?

A. Yes.

C. Q. 93. Did you make this exhibit marked "Defendant's Exhibit Model Allcott Bearing Patent"?

A. It was made under my instruction.

C. Q. 94. Does it correctly represent the structure shown and described in the patent?

A. It does, substantially.

C. Q. 95. What do you mean by "substantially"?

A. I mean that it has beveled rollers and has a long bearing surface, and that the ends of the beveled rollers run against a nut and shoulder of similar shape to that shown in the Allcott drawing, except that the nut and shoulder is made so that a portion can be removed to make the operation of the rollers more clear. The rollers of the Allcott patent are described as being of two sizes, but I did not deem that essential as showing the construction of the rollers or the parts they work with.

C. Q. 96. There are two sets of rollers in the Allcott patent, are there?

A. There are.

C. Q. 97. You have shown only one set in the model, have you?

A. I have filled the space with rollers all of one size.

C. Q. 98. How many sets are there, one or two? You say there are two sets in the patent. How many are there in the model?

A. One set.

C. Q. 99. I see one set of rollers in the patent is marked "H," the other set marked "I." Which set of rollers have you made in the model, H or I, if either?

621 A. The rollers I have made correspond to either set, H or I.

C. Q. 100. How is it possible? Please explain. It's something like "now you see it and now you don't see it," isn't it? Will you

please tell which set of rolls you intended to represent in this model, H or I, if either?

(Defendants' counsel desires to object to the use of slang, such as "now you see it and now you don't see it," contained in the last question.)

A. It represents both, as I previously stated. The difference in the rollers is not in their shape, but in the relative size of the two sets of rollers.

C. Q. 101. You don't know, then, which you did intend to represent, H or I, the small or large rolls, and are of the opinion that it makes no difference, are you?

A. The model is proportioned so that the rollers shown as H of the drawing are provided. The witness had very little time to prepare these models and, deeming the smaller set of rollers not material to a correct understanding of the difference between this invention of Allcott and the invention shown in the Peters patent, did not make the small set of rollers, I, of the Allcott drawing, for the specification states, after describing the journal box: "Into the space intervening are placed the larger, longitudinal, metal rollers H, which may be of any number and size sufficient to nearly fill said space around the journal. I I are a series of smaller rollers inserted in the interstices between the larger rollers H, and whose ends are beveled and project into the concentric grooves *h* in the flange C and nut D."

C. Q. 102. Well, now you have concluded that the set of
622 rolls shown in the model are the large rolls H of the patent, have you, and that you omitted to show the series of smaller rollers I I shown in the patent?

A. Yes.

C. Q. 103. Have you shown the grooves in the model representing the concentric grooves *h* of the patent?

A. Yes.

C. Q. 104. What is in them, if anything, in the model?

A. The beveled ends of the large rollers.

C. Q. 105. What is in these grooves in the patent, if anything?

A. The beveled ends of the large rollers.

C. Q. 106. The patent says that the beveled ends of the small rollers project into the concentric grooves *h*, does it not?

A. Yes, and the large ones, also. There is room for both.

C. Q. 107. Do you mean that they both project into the same groove, as you understand it?

A. I do.

C. Q. 108. Please find where it says that the lage rolls project into the groove.

A. The patent states, after describing the rollers H, which may be of any number and size to nearly fill said space: "I I are a series of smaller rollers inserted into the interstices between the larger rollers H, whose ends are beveled and project into the concentric grooves *h* in the flange C and nut D." This describes the shape of the smaller rollers and describes what they go into. It states there: "The ends

of the rollers H are also somewhat beveled" (that is, beveled like the small ones) "to correspond with the tapering portions *d* and E of the journal B and nut D." Now, this tapering portion *d* and E
623 is the part of the concentric groove in which the small rollers run, such part being shown in the drawing as the conical or beveled portion of the groove nearest to the longitudinal centre line of the axle.

Recess.

C. Q. 109. You don't find any place in the specification where it says that the large rollers H project into the concentric grooves *h*, do you?

A. I find where that is implied, but not stated in those words.

C. Q. 110. Does Fig. 1 of the drawing show a longitudinal vertical section through two of the large rolls H?

A. It does.

C. Q. 112. Is there not a vertical line at each end of each of those rolls showing their ends?

A. There is such a vertical line.

C. Q. 113. Is there not also shown the end of one of the small rolls I in the groove *h*, projecting beyond the end of the roll H, in that drawing?

A. Yes; there is.

C. Q. 114. Are not the vertical lines showing the ends of the large rolls H on a plane with the inner faces of the flange C and nut D?

A. They are.

C. Q. 115. If those lines, then, indicate the ends of the rolls H their ends do not project into the groove *h*, do they?

A. They lay on one side of the groove. The outer edge of the groove in the drawing, being less prominent than the lower edge and not being a wearing surface to the extent that the inner one is, has not been made in the drawing to quite overlap the inner
624 one, but this difference is not considered of any importance by me. The only effect that I can see caused by the slight difference between the drawing and the model is to make the model look less like the Peters patent than the drawing does.

C. Q. 116. Do you mean that you made the model different from the Allcott patent for the purpose of making it less like the Peters patent?

A. No; I do not.

C. Q. 117. If the inclined parts which you call a part of the groove *h* was considered by the patentee a part of the groove *h*, why did he give them another name and a different lettering?

A. I do not know.

C. Q. 118. If the model had been made like the Allcott patent, with the rolls H terminating at the inner faces of the flange C and nut D and with the rolls I omitted, there would be nothing to hold them in place when the wheel was removed, would there?

A. No; I think not.

C. Q. 119. Then you have made the model with a set of rolls dif-

ferent from either of the two sets of rolls in the patent, and made only one set of rolls instead of two, haven't you?

A. I have filled the whole space with rolls like the large roll H, and left out the small rolls, which do not illustrate anything material to this case. The large rolls H go into the groove of which the beveled shoulder *d* is the termination at one end, and the beveled sleeve the termination of the groove in the other end. The difference between this model and the drawing and specification of Allcott is simply in proportionate sizes of the parts, and does not change the construction.

625 C. Q. 120. Don't you think that when you make a model and swear you made it like the patent it would be a little fairer to the court to make it like the patent and let the court judge as to the material and immaterial parts, and for you to give your opinion as to what is material and immaterial when you are asked, and try to answer the questions instead of volunteering opinions not asked for?

A. I find there are too many questions contained in the statement made by the complainant's counsel to answer by "yes" or "no," which kind of an answer the question starts out by requiring. If the counsel will subdivide his question I will endeavor to answer it.

C. Q. 121. Did you make the groove *h* in your model larger or smaller in proportion than the groove *h* shown in the patent?

A. Yes; larger.

C. Q. 122. Why?

A. Mainly so that the rollers would stay in their places conveniently.

C. Q. 123. How many times larger do you think you made them?

A. The model is in evidence. The court can determine itself how much larger it is.

C. Q. 124. What part of the model represents the shoulder C of the patent?

A. The part nearest the handle or piece representing the attachment to the wagon.

C. Q. 125. Can you describe it?

A. If the counsel will show me the patent of Allcott, to find where letter C is, I will explain where shoulder C is on the model.

C. Q. 126. You can't do it by having the model without having the patent, can you?

626 A. Not positively, because I do not know what letter C refers to, or whether C or *c* is meant, both of which, I think, are shown on the drawing.

C. Q. 127. The question shows what shoulder I ask about, whether C or *c* or any other see.

A. Well, I leave it to the court to judge.

C. Q. 128. Is there any shoulder on the model corresponding to C of the patent?

A. Whatever shoulder is shown in the drawing is shown on the model.

C. Q. 129. And all the flanges shown in the patent are shown in the model, are they?

A. The two flanges forming part of the bearing are shown in the model. There may be some flanges in the drawing of the hub omitted from this model of the bearing.

C. Q. 130. Is the flange D represented in the model? If so, will you describe it?

(Defendants' counsel instructs the witness that he is entitled to have the patent before him in answering these questions if he does not remember the identification of the parts without referring to the patent, and that he may decline to answer the question so long as the patent is withheld from him.)

(Counsel for complainant simply wishes to correct the false impression that is being spread of record in reference to withholding any patent from the witness. The witness examined the patent after the question was asked him about the flange or shoulder C, and has had the patent in his hand a good deal of the time during the examination, can look at the patent now to inform him which flange is meant if he will take the trouble, and, furthermore, I will state for the information of the counsel on the other side, who does not seem to know it, as indicated by his instructions to his witness on the record and otherwise, that I have a right to test the knowledge and recollection of this witness on cross-examination in the absence of model or patent.)

627

A. It is. It is that portion of the bearing which screws onto the extremity of the model as a nut does, and is in fact a nut.

C. Q. 131. Of how many parts is this nut composed in the patent?

A. Shown as one part; not described as one, however.

C. Q. 132. Of how many parts did you make it in the model?

A. Of two parts, as stated in my direct examination.

C. Q. 133. Of how many parts did you make the flange or shoulder C in the model?

A. Two parts.

C. Q. 134. Of how many parts is it in the patent?

A. One part, as stated in my direct testimony.

—. Q. 135. Did you pay any attention in making this model to sizes and proportions of parts?

A. I did.

C. Q. 136. If you enlarged the grooves *h* did you enlarge the flange of the nut and also the flange C in which the patent shows the grooves proportionately?

A. No.

C. Q. 137. Why not?

A. I did not consider the enlargement at all material to a proper understanding of the construction of this bearing.

628

C. Q. 138. You mean, then, that you did not make the model proportionately, don't you? That you exaggerated and enlarged some parts without enlarging others, just as you deemed it material or immaterial?

A. No; I did not.

C. Q. 139. You omitted certain parts that you deemed immaterial, didn't you?

A. Yes; I did; some parts shown on the drawing and in the specification, but those omitted parts are parts of the hub and means for keeping the rollers in place, and I have not omitted any parts of the axle-bearing,

C. Q. 140. Have you made the nut D on the model like the nut shown and described in the patent?

A. Yes; substantially.

C. Q. 141. If you were to put a hub on this model, where would the outer end be, relative to the nut?

A. The outer end of the hub—that is, the usual ring of a wooden hub and as shown in this drawing—would extend over the nut nearly level with the end of the screw. The ring on the inner end of the hub would extend over the beveled and flanged shoulder and both rings would be large enough in diameter to pass entirely over both of them—that is, if I was making it like the specification.

C. Q. 142. You must have misunderstood my question, and I will put it in another form. In this model, "Defendant's Exhibit Allcott Bearing Patent," where are the shoulders that are intended to hold the hub of the wheel on its bearing?

A. The beveled shoulders of the rollers are the parts referred to.

C. Q. 143. Are the beveled end- of the rollers in contact with any part of the hub of the wheel?

A. Not now.

629 C. Q. 144. Would they be if there was a hub put on this model?

A. Yes; they would.

C. Q. 145. Explain when.

A. When the nut is adjusted so that the long parallel sides of the longitudinal taper-ended rollers touch the shaft, as Allcott intended them, and when those same taper-ended rollers touch on the beveled shoulder of the bearing and the beveled edge of the nut, the questioner will see a portion of the beveled edge of the roller exposed, just as the beveled edge of the same roller is exposed in the Allcott patent, and space is shown in this model where internally flanged edges of the Allcott hub may be placed and be in contact with the beveled ends of the rollers and bear on the longitudinal sides at the same time.

C. Q. 146. I have not yet found out where the outer end of the hub would be. Would it be against that thin shoulder on the model that you have milled for the purpose of turning the nut?

A. If the questioner means where might the end of the hub be, I would say that no particular place is required for the hub to terminate.

C. Q. 147. What shoulder on that nut on the model, if any, did you intend, when you made it, to have rest against the end of the hub to hold it in place? Was it that shoulder on the thin milled flange shown on the model?

A. I did not intend this to show how the hub was constructed.

C. Q. 148. Did you intend to make it so that it was adapted to receive a hub?

A. I did.

630 C. Q. 149. Well, if so, what shoulder would hold the hub on?

A. The exposed beveled ends inclining both ways will keep the hub from coming off. In this model the amount of the shoulder is not large enough to wear for any great length of time, as such criticism of the model was not contemplated; but the shoulders are on the model, and beveled ends of the rollers are exposed when the rollers are adjusted in the model as the drawing shows them to be adjusted, and they do have means for preventing endwise movement of the hub if a model of the Allcott hub was put onto this model of the bearings.

C. — 150. When you brought this model here you had a metallic cylinder with it that would just fit between these shoulders on this model, extending over the rolls and over the cylindrical smooth parts at each end of the rolls to the shoulders, did you not? If you did, what has become of it, if you know?

A. I did not bring the models here. They were sent to me after being made through my instructions, and when I found the model with a piece imperfectly representing a part of the model I removed it before testifying or offering it in evidence.

C. Q. 151. Well, please state how it fitted on this model, because I've asked you three or four times.

A. If fitted outside of the inner portion of the nut and part most projecting of the flange, and its length was sufficient to fit just between the two largest projections on the model.

C. Q. 152. You have concluded, have you, that these two largest projections, making two shoulders, on this model are not according to the patent and don't belong there?

631 A. I never stated that they were. They are not shown in the patent. They perform no function, anyway, and were never designed to. They happen to be there because they are made out of the portions designed for bicycles that were threaded inside and had those objectionable flanges outside and were not originally made for this exhibit, but are altered pieces, the milled edge on one end being purposely left that the nut might be conveniently adjusted.

C. Q. 153. Then this part of the model was not made wrong and unlike the patent by design, but accidentally, was it?

A. I do not admit that this model was made wrong. I said that this model represented substantially the patented Allcott bearing, and such statement I still affirm.

C. Q. 154. I find in your direct testimony, where you produced the Allcott model that you are now testifying about, you stated, "I have also provided rollers of the Allcott patent, with the case for the same, which I will describe later." The defendants' counsel then immediately offered the model in evidence which you had provided with a case, as you stated. You afterwards in describing

it in your direct examination described the case as being with it and as showing the more complete device of Allcott. Will you now produce that case that the court may see what you testified to and that it may remain as a part of the model?

(Defendants' counsel states that he offered the model in evidence and offered it in evidence without any case, but that in view of the apparent uneasiness of the complainants' counsel he will hand the same to him and let him offer it as a part of his evidence if there is no objection on the part of the witness, who intimates that there is.)

632 A. I remember my testimony in that particular, but had not read it since it was written. I think, however, that the questioner purposely misquotes my answer. I remember to have said before offering the model, I have also provided rollers of the Allcott patent, with the case for the same removed, and I would like the questioner to read that answer over again.

C. Q. 155. There is no misquotation. The witness can read his own deposition if he wishes to. I have found the place for him. It reads as follows, commencing after a period: "I have also provided rollers of the Allcott patent, with the case for the same, which I will describe later." That ends the quotation and ends the sentence in his testimony. Then follows the language, commencing as follows: "Defendants' counsel offers in evidence the model just testified concerning by the witness and requests the notary to identify it with this record and mark it "Defendant's Exhibit Model Alcott Bearing Patent."

(Counsel for complainant wishes to inform the court that the insinuations of witness in reference to my intentionally misquoting, without taking the trouble to inform himself, is substantially in keeping with his entire conduct of apparent prejudice, feeling, and effort to misrepresent and convey false impressions entirely unbecoming a sworn witness and supposed to be entirely impartial and only seeking to tell the whole truth. Last question repeated.)

(Defendants' counsel informs the court that it is perfectly evident from the testimony of this witness that he is endeavoring to escape confusion and state the exact facts as he understands
633 them to be, and that it is perfectly evident from the testimony of this witness that he understands the model was offered in evidence exactly as it is tabbed and appears and without any sheathing and case, and defendants' counsel, to avoid any criticism or question about this matter, will furnish this sheathing or case if he can obtain it if the witness refuses to produce or recognize such case as a part of his testimony as he understands it, and defendants' counsel consents for the complainants' counsel to produce a case for this model if he so desires.)

A. I will produce the case. I am positive that the case did not accompany the bearing when put in evidence. I am positive that I never described the case except to say that it was removed from the model before putting it in evidence.

C. Q. 156. Where is the case? Please produce it.

(Defendants' counsel here offers in evidence, for the purpose of stopping what he considers a waste of time, the case referred to by complainants' counsel, and instructs that the same be marked "Defendant's Exhibit Case Inquired of, C. Q's 150 to 156.")

Adjourned to Saturday, August 27, 1887, at 10 o'clock a. m.

SATURDAY, *August* 27, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

C. Q. 157. Do you claim that the bearings connected with the axle in the "American Champion" and "American Light Champion" are like the oppositely inclined conical bearings shown and described in the Peters patent?

634 A. They have oppositely inclined faces which are in some respects like and in some respects unlike the oppositely inclined conical parts of the bearings of the Peters patent.

C. Q. 158. Are they substantially the same elements, in your opinion, sufficiently alike to constitute an infringement? Please answer "yes" or "no" and then explain.

(The witness is instructed that he is not obliged to answer "yes" or "no.")

(Counsel for complainant objects to erroneous instruction of witnesses by counsel in the absence of court, and gives notice that if it isn't stopped he will object to the further taking of testimony in the absence of an officer of the court or away from where proper instructions can be obtained.)

(Defendants' counsel states that if complainants' counsel insists upon the above in violation of his professional assurance before the beginning of the taking of this testimony defendants' counsel requests an adjournment until Monday morning, at 11 a. m., when and where complainants' counsel can be compelled to attend and conduct his cross-examination without any such statement and objections as contained above.)

Complainants' counsel is sorry to be compelled to say in contradiction of the statement of counsel just made that he has violated no professional assurance in making the above objection and is entirely at a loss to know what counsel can mean by any such insinuation, but it is in keeping with the almost constant unprofessional insinuations, erroneous inferences, and a sort of guerilla method that has been practiced, to which I no longer care to submit.

635 Defendants' counsel calls the attention of the court to this record as a flat contradiction to any such statement or suggestion as contained in the last statement of complainants' counsel, and requests complainants' counsel to proceed with the cross-examination if he can do so with any regard to the rules of evidence, the rights of the witness, or the duties of defendants' counsel.

I shall conduct this cross-examination as I have conducted it, and enter objections as severe as I have or more so if I deem the occasion

requires, because I consider that I have been extremely reserved thus far in that regard and have frequently borne almost past that which is becoming one who has any regard for what is due an opposing counsel, and I join in the request to have the taking of this testimony adjourned to such place in the city of Chicago as defendants' counsel may appoint.

Defendants' counsel again points to this record as a refutation of any such statement as contained in the last recorded assertion of complainants' counsel, and refrains from referring to the unwarranted personal assaults of complainants' counsel upon the witness as shown by this record, and refrains also from criticising the conduct of complainants' counsel as shown by the record, and defendants' counsel states that the only objection there is to permitting complainants' counsel to thus interrupt the taking of this testimony is the fact that defendants' time is limited as to the closing of their proof, and asks complainants' counsel if he will consent of record here that defendants' time may be extended seven days for the completion of their proof, or from September 10 to September 17, defendants' counsel stating as a further reason for this that a portion of defendants' testimony yet to be completed is to be taken
636 in an Eastern State, and the long time continuously occupied in taking this testimony makes it almost compulsory for defendants' counsel to devote a few days to other matters before the completion of this testimony.

Having already granted ten days' extension, and as the case is set for hearing on the 25th of October, I decline to grant of record the seven days of time asked for, and again join the defendants' counsel in requesting an adjournment to such place in Chicago as defendants' counsel may appoint.

Defendants' counsel beg leave to call the attention of complainants' counsel and also of the court to the fact that when complainants were recently taking testimony in Boston in these cases and when the time of the complainant was exceedingly short for the putting in of its proof defendants' counsel, by a stipulation of record, extended the time of the complainant ten days for the completion of proof at that time, and attended upon and consented to the examination of two witnesses at the same time during at least one day, and it is defendants' counsel's recollection that it was also stipulated in writing that the complainants' time for taking testimony in surrebuttal, which by order of court expired October 1st, prox., should be extended ten days, or to October 10th, and in view of these facts appearing of record, and in view of the seemingly extraordinary proceedings of complainants' counsel in interrupting this examination and wasting defendants' time, defendants' counsel again requests that if the interruption of this examination is insisted upon as above appears, and in view of the facts as otherwise appears, complainants shall enter of record an assent to an addition of seven days to defendants' time, it being perfectly apparent that this will in nowise interfere with the hearing of this case.

637 The record shows that defendants' counsel was the first to interrupt the taking of this testimony and request an adjourn-

ment, and, notwithstanding this, he deliberately enters of record the accusation just above. I have nothing further to say except to again comply with the defendants' counsel's request for an adjournment.

Defendants' counsel willingly leaves to the court the question who has so far interrupted this examination, and, irrespective of the assertions or utterances of record so far, requests complainants' counsel either to proceed with the examination or assent to what appears to defendants' counsel to be a manifestly reasonable request for an addition of seven days to defendants' time, and defendants' counsel here states that if complainants' counsel construes anything in this record heretofore stated by defendants' counsel to be a request for an adjournment or an interruption to the taking of this testimony he withdraws the same, and again requests complainants' counsel to proceed with the cross-examination of this witness or consent to the addition of said seven days of time, and in neglect or refusal of complainants' counsel to do either of the above defendants' counsel shall direct the witness to sign this deposition as a deposition closed.

If the counsel for the defendants is through with his interruption of the witness I call his attention to the fact that there is a question to be answered.

A. I cannot reply intelligently without an explanation of what the counsel calls the "bearings." Does he allude to the shoulder and nut on the axle or does he mean the parts which the hub bears on?

C. Q. 159. You make the ball bearings of your front wheels with a divided inside box, do you not?

A. Yes; defendants do.

638 C. Q. 160. With oppositely inclined cone bearings on the axle?

A. Yes.

C. Q. 161. Those bearings are not grooved bearings, are they?

A. Individually the cones are not. When they are placed together they are.

C. Q. 162. Don't you make similar cone bearings on the axle of the rear wheels?

A. No.

C. Q. 163. They are grooved bearings, are they, on the rear wheels of these two exhibits, "American Champion" and "American Light Champion," instead of being conical like the bearings of the front wheels?

A. They were when they left the factory, and are so now if they have not been tampered with.

C. Q. 164. Will you please examine them and see if they have been tampered with?

A. I have examined them and find that they have not, and that they are grooved where the balls rest.

C. Q. 165. You mean by the groove that the face of the cone is slightly curving, do you?

A. I mean that the shoulder of both the nut and axle instead of being coned is hollowed and grooved. The face of this shoulder may be at right angles to the axis of the shaft. It may be convexly curved. It may be coned or it may be concavely curved. The latter is the form of this bearing which I have also termed "grooved."

C. Q. 166. You think, then, that that is a material difference, making a substantial and material difference between the cone bearings of the front wheels and the corresponding bearings of the rear wheels, do you?

A. No; but it makes a difference shown by our constant
639 use of the grooved bearing at the rear wheel and the cone bearing of the front wheel.

C. Q. 167. You call those bearings on the rear wheel the same as the grooved collars C and D of the J. Smith patent, do you?

A. Substantially.

C. Q. 168. Are they different? And, if so, describe the difference.

A. The nut and the piece opposite to it, in which the ball bearings roll, are grooved to the extent of about half a circle, whereas the grooves in the nut and axle as the defendants make them are grooved to the extent of about a quarter of a circle.

C. Q. 169. Why don't you make grooved rings like the Smith patent instead of slightly grooved conical bearings?

A. Because we find that only one-half of a half of the groove supports the bearing balls, and as the other half is useless we omit it.

C. Q. 170. If you made a half-grooved box to rest on the balls, as shown in the Smith patent, the balls would bear on both sides of the grooves in the rings C and D, would they not?

A. They would.

C. Q. 171. Do you make the other parts—as, for instance, the plates H H shown in the Smith patent—in your rear-wheel bearing?

A. Yes.

C. Q. 172. The same as shown in the patent?

A. Substantially.

C. Q. 173. How does it differ, if at all?

A. It differs in being connected to the part G of the hub
640 by a screw-thread cut on the inside of an annular flange instead of being screwed on by bolts *u*, but this is the other suitable manner of attaching the plate H provided for in the patent. They also differ in not having their inner surface in contact with so much of the bearing balls as the drawing shows.

Recess.

C. Q. 174. Are both of the plates H in the exhibits secured to the hub of the rear wheels?

A. Yes.

C. Q. 175. Neither of them are secured to the axle in any way, are they, in the exhibits?

A. In the Exhibits "Champion" and "Light Champion" no, which I understand to be the exhibits.

C. Q. 176. Does the plate H on the outer end serve to secure the hub on the axle on the exhibits?

A. When improperly adjusted it does, and when properly adjusted it does not.

C. Q. 177. What does secure the hub on the axle in those exhibits?

A. The balls combined with the faces of the hub ends against which they abut.

C. Q 178. Do you use a threaded nut?

A. Yes.

C. Q. 179. Does that nut have one of the inclined bearings which you say corresponds to the grooved collar D of the Smith patent?

A. It has the groove on one side corresponding to the groove in the collar of the Smith patent, but, as stated before, the groove is about one-quarter of the circle, whereas in the Smith patent a groove formed of half a circle is shown.

641 C. Q. 180. If the groove formed a half circle and held the balls, as shown in the Smith patent, you could not screw the nut from the axle and insert it, as you can in the exhibit machines, could you?

A. No.

C. Q. 181. Wasn't that one reason why you use only half of the groove bearing shown in the grooved rings D and C of the Smith patent?

A. That is an incident and a result after finding that the quarter of a circle for the groove in the nut and shoulder is all that is necessary. The nut and shoulder is no better with the half a circle forming the groove than with a quarter of a circle, and with the quarter of a circle left off the nut can be withdrawn and inserted, and therefore the reduced groove is advantageous.

C. Q. 182. Doesn't this nut keep the hub on the axle of the exhibits?

A. Yes; it does, with the balls.

C. Q. 183. Doesn't it keep the hub on when there are no balls in?

A. The axle could not be removed without unscrewing the nut if there were no balls, and it is not correct to state that the nut is the only thing that keeps the hub upon the axle when the axle and hub are adjusted together for use.

C. Q. 184. The balls serve no purpose to keep the hub on the axle when the nut is removed, do they?

A. In one direction, yes; in the other direction, no.

C. Q. 185. Which direction do they serve that purpose when the nut is removed?

A. Keeps the hub from moving in the direction away from where the nut was.

C. Q. 186. What do they hit against?

642 A. The balls being interposed between the quarter of a circle groove at the shoulder of the axle and one-quarter on the hub opposed to the grooved shoulder—the balls being between those

opposite shoulders forms an obstacle to the movement of the hub on the axle in the direction towards one another.

C. Q. 187. Then the shoulder on the axle keeps the hub on the axle in one direction, and the nut with the shoulder keeps the hub on the axle in the other direction. Isn't that it? And you remove the nut with its shoulder from the axle and you could remove the hub from the axle, and the shoulder on the axle inclined oppositely to the shoulder on the nut keeps the hub from moving on the axle in that direction, but the balls are between these shoulders, rest against them and also against inclined shoulders on the hub, and thereby make the adjustment you speak of. Is that also correct?

A. Yes, substantially.

C. Q. 188. The plates H, which you say form no part of the nut in the exhibits and forms no part of the fixed grooved collar C, hold the hub on the axle in the Smith patent, do they not?

A. Not necessarily.

C. Q. 189. How would you remove that Smith hub from the axle?

A. Remove the nut and also remove the plates H H.

C. Q. 190. What do you mean? Please give the letter indicating it.

A. The nut represented by the collar D.

C. Q. 191. Could you remove that before you remove the plate H?

A. Not as this drawing shows.

C. Q. 192. Mechanically and as an expert you are of the opinion that the grooved collar D should have been called a "nut," are you?

643 A. No.

C. Q. 193. You claim to make the ball bearings of the front wheel like the Jeffery patent of 1883, No. 275,917, do you?

A. No.

C. Q. 194. You don't make them under that patent, do you?

A. No; not precisely. We make the outside of the ball-bearing case and the fork end partly in accordance with that patent.

C. Q. 195. Do you make the bearings like the one shown in this patent, substantially?

A. No.

C. Q. 196. The bearings of the front wheels of the Exhibit "American Champion" and "American Light Champion" are, then, substantially different from the ball bearing shown in this Jeffery patent, are they?

A. Yes; they are.

C. Q. 197. The bearings in those exhibits are on two sleeves with bearings oppositely inclined, conical in form, and adjustable one toward the other, are they not?

A. Yes.

C. Q. 198. Is it your opinion that a ball bearing constructed like the one in the Jeffery patent above named would anticipate the bearings of the Wallace patents if of prior date?

A. In some respects it would.

C. Q. 199. But as to material parts, it being substantially different, as you have stated, it would not, would it, in your opinion?

A. The question is not sufficiently exact for me to clearly answer.

644 C. Q. 200. Which do you think is more like the Wallace patent bearings—this bearing shown in the Jeffery patent or the bearing shown in the Smith patent?

A. The question is of such a nature that I cannot give a positive answer. There are two Wallace patents, which contain together about half a dozen claims. The invention of both the Wallace patents, if any such invention exist, consists of a combination of elements in a peculiar way set forth therein. Some of these elements are shown in the Jeffery patent; some are not, and the question is too broad and inclusive to answer in a manner that would be clear or clearly understood.

C. Q. 201. I see in this Jeffery patent you show a divided outside box for the ball bearings. Do you make a divided box for this bearing in your "American Champion" and "American Light Champion"?

A. The counsel means the fork end is divided—not the bearing box. We do make it so divided, but with a vertical division instead of a horizontal division, the latter being shown in the patent.

C. Q. 202. I mean the bearing box, as asked. Do you make that divided in your "American Champion" and "American Light Champion"?

A. No; undivided.

C. Q. 203. With an undivided outside box for the ball bearings is it not necessary, in order to assemble the balls in that bearing, to have a divided inside bearing for the balls?

A. Yes; it is.

C. Q. 204. There is an undivided outside bearing box in the Wallace patents, is there not, and a divided inside bearing composed of sleeves on the axle, adjustable one towards the other?

A. Yes; there is.

645 C. Q. 205. You use such structure in the ball bearing of the front wheels to your "American Champion" and "American Light Champion," don't you?

A. Yes; the undivided outside box and the divided inside sleeve.

C. Q. 206. The undivided bearings for a row of balls consisting of a grooved collar having a half a circle in the groove like that shown in the Smith patent could not be used with an undivided outside bearing box, could it?

A. Yes.

C. Q. 207. You just said that an undivided outside bearing box could not be used with an inside undivided bearing box, as I unstood you. Please explain how an undivided collar having a half circle groove for the balls like that shown in the Smith patent could be used in an undivided outside bearing box like that shown in the Wallace patents.

A. No reference was made in the question before the last to the outside collar being like the Wallace outside bearing box. The

question stated simply an outside bearing box, and my answer was correct. Of course, if the outside bearing box is grooved as deeply as the Wallace patent shows and the collar as deeply as the Smith patent shows, some arrangement must be made to admit the balls.

C. Q. 208. If you cut these grooved collars shown in the Smith patent through the bottom of the groove so as to make two collars out of one, making thereby a divided inside bearing, then you could use them in an undivided outside box like the Wallace, although their bearing faces were left curved instead of being uncurved conical bearings, could you not?

646 A. The word- "curved cone" is not intelligent, but otherwise the device could be used as stated.

Adjourned to Monday, August 29, 1887, at 11 o'clock a. m.

MONDAY, *August* 29, 1887—11 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

C. Q. 209. In experting the saddle patents do you understand that the term "hammock seat," as applied to velocipede seats, designates or distinguishes between an iron, wooden, or other similar non-flexible material and a flexible seat like leather or cloth or other similar flexible material?

A. I understand that the word "hammock" does not describe any particular material. It includes a seat made of any material thin enough to bend to a more or less extent and supported at its ends.

C. Q. 210. In making the model which you have introduced, marked "Defendant's Exhibit Model Shire 1879 Patent," did you make it just like the patent, paying particular attention to proportions?

A. I made it substantially like the patent; did not purposely alter any of the proportions and did not measure any of the parts to see that they were in proportion, but made the model with care to show what I understood to be described there.

C. Q. 211. You paid no attention to the drawing of the patent when you made the attachment of the front of the hammock seat to the metallic spring, did you, so as to attach it about the relative distance from the top of the spring that is shown in the patent?

A. I did, but as the back of the seat was accidentally made
647 a little too high to show the leather in about its proper position horizontally the front strap was raised somewhat higher on the front spring than the drawings show; but this deviation I do not consider makes any material change in illustrating the invention.

C. Q. 212. The Harris patent, the Schmidt patent, and the Curry patent that you experted in connection with the Shire are all horse saddles with trees, pommels, etc., are they not?

A. Yes; the pommel being the front support and the tree being the piece the front support is fastened to.

C. Q. 213. The only other patent you experted in connection with

the Shire as containing any of the features of the Shire was the Lamplugh & Brown English patent of 1878, and was the only patent that you handled in that connection which was for a bicycle or velocipede saddle, was it not?

A. I think it quite likely that I did expert on those patents only, in connection with the Shire.

C. Q. 214. This Lamplugh & Brown bicycle saddle is not attached to a spring at its front end, is it?

A. One drawing shows that it is; one drawing shows it is not.

C. Q. 215. Which drawing shows that it is?

A. Fig. 1 and Fig. 2.

C. Q. 216. Is there anything said in this patent about the plate *d*, to which the seat is attached at both front and rear ends in Figs. 1 and 2, being a spring plate, that you can find?

A. I do not recollect those words.

C. Q. 217. Look at the patent and see if you can find it.

A. There is not.

648 C. Q. 218. The Veeder patent shows a suspended saddle bicycle seat with each end attached to a spring, instead of one end only, those springs being in two parts or two separate springs and made adjustable, does it not?

A. Yes.

C. Q. 219. The Miller and the Nelson patents that you experted as anticipating the Veeder are horse saddles with trees, pommels, and seat frames, are they not?

A. Yes.

C. Q. 220. Do you consider that you made the model concerning which you have testified and which was marked "Defendant's Exhibit Model Nelson Patent" like the Nelson patent?

A. Yes, substantially.

C. Q. 221. Explain how it differs from the patent and how it happened to so differ.

A. It differs a little in proportionate size of some of the parts, and it differs in this way because the time for making it was very limited. It was also made when I was not able to be with the workman who actually constructed it under my instruction the whole time, but it represents substantially the elements of the Nelson patent as I understand it.

Recess.

C. Q. 222. Have you described all the differences between the model and the patent that you know of?

A. The cover is secured to the front support in a different manner from that described, and the adjustable under plate or under spring is made partly out of a base of a bicycle saddle. These are the only points that occur to me as being different from the drawing, but they do not affect or alter the combination of the elements it is my desire to show.

649 C. Q. 223. Is the front end of the metallic seat in the model attached to a spring?

A. Yes.

A. Yes.

C. Q. 240. And all you mean when you say its slack may be taken up is that the spring upon which it rests may be made a little more or less rigid or a little more or less stiff? Is that what you mean?

A. I said that the link *l'* may have its slackness altered by the adjustment of the spring M from or towards the spring L, and I maintain that as the link *l'* is a flexible part of the seat as well as the spring K, that extending its points of support will make the link assume a horizontal position, and the spring M and also the part of the seat K to be subject to a greater tension by such removal and adjustment.

C. Q. 241. Do you make any distinction, as an expert, between the mechanisms of the Veeder saddle and the mechanisms
653 that are made the subject-matter of the first claim of the patent marked "Complainant's Exhibit Kirkpatrick Patent"?

A. Yes; I do make a distinction.

C. Q. 242. What is it?

A. The difference will depend on how the patent to Kirkpatrick, claim 1, is defined. If the cousel will define what he considers what Kirkpatrick claimed I will be better prepared to state the difference.

C. Q. 243. I want the difference as you, as an expert, understand it to be.

A. I understand the first claim of the Kirkpatrick patent to be the combination with the perch or backbone of a bicycle or similar vehicle of independent front springs, as described, and independent rear springs, as described, secured to said perch or backbone as described, and a flexible seat suspended directly from said springs, as described, at the front and rear respectively, substantially as set forth. The front spring of the Kirkpatrick patent is in every view and modification shown as a bifurcated spring extending each side of the bicycle head, while the Veeder front spring is not bifurcated and secured further back. The rear spring of the Kirkpatick is not secured to the front spring as the rear spring of the Veeder is, but is secured to the backbone by a housing and set-screw, and this constitutes a material difference between the two patents.

Adjourned to Tuesday, August 30, 1887, at 10 o'clock a. m.

TUESDAY, *August* 30, 1887, 10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

C. Q. 244. In making the model "Defendant's Exhibit
654 Model Bishop Patent" did you make it of the same proportions of the patent and have it contain all the parts shown in the patent so that it would properly represent the horse saddle there shown, or did you make it as near as you could to represent a modern bicycle seat?

A. I made it of about the proportion shown in the drawing, but in making those parts no attempt was made by me to show either a horse saddle or a bicycle saddle. The leather portion of the

model was not made specially for this exhibit, and the hook at forward end and rear-end stretcher was made to be used on a bicycle; but, as I do not understand that the form of the leather or the use it was intended to be given was a material part of the invention of Bishop, I did not make a special cover, considering the one I had already made for another purpose sufficiently represented a suspended leather seat. The front and rear springs are somewhat longer than the drawing shows, for it was not my intention to make a model exact in all proportions. I made the model, however, to represent truthfully and substantially the elements of the Bishop patent, as far as they relate to the alleged invention of the Shire, Veeder, and Kirkpatrick patents.

C. Q. 245. Then you made those elements as near as you could like what you deemed corresponding elements of the Shire, Veeder, and Kirkpatrick patents, did you, so that no one would mistrust it represented a horse saddle instead of a bicycle saddle, and did you intentionally make the front "upright elastic steel bar" bifurcated so that, in your opinion, it would look a little more like the bifurcated front spring of the Kirkpatrick patent, while you made the rear "upright elastic steel bar" of different shape, or did you find a warrant in the patent for making them thus differently?

A. I cannot answer so that I could be fully under-
655 stood a question that is a collection of questions. If each is submitted separately I will willingly and promptly answer them.

C. Q. 246. The uprights to which this seat is connected are called in the Bishop patent "upright elastic steel bars B," are they not?

A. Such is my recollection of the specification.

C. Q. 247. Why don't you call them so in your deposition?

A. Because I think I have used a shorter term and a term which would just as well describe it.

C. Q. 248. You say you made these uprights longer in proportion than shown in the patent. Was that intentional, so that they would be a little more like springs in their operation, and so that you could call them "springs" in your testimony with a little better warrant instead of upright bars?

A. It was not.

C. Q. 249. Why did you make one upright bar in the model bifurcated and the other one not, and how did it happen that the front one instead of the rear one was bifurcated? Was it intentional?

A. It was my intention to make the springs, as described in the patent as "upright elastic steel bars," bent somewhat, as the drawing shows, and in giving my instructions to the workman my attention was called to the words in the specification which state that the loops may be constructed of flat plates or bars, or round rods may be used, and I instructed the workman to make one spring from a round rod that happened to be laying before him and already bent and a part of another piece of steel that was laying near him.

I know that the round rods mentioned in the patent concern
656 the loops, but at the time of giving the instructions I over-

looked that statement; but such difference in the shape of the material which form the springs mentioned in the Bishop patent and called "springs" and called "upright elastic steel bars" makes no difference in the operation of any of the elements in so far as the exhibit model shows the elements of the Bishop patent and their operation. The leather of the saddle seat may be changed by unhooking the ends of the same and its position reversed by the counsel, if he desires. The hooking to either spring of the front of the saddle was accidental on my part, and makes no difference, in my estimation, in effecting a substantial representation of what Bishop's patent shows.

C. Q. 250. The loops *a* are shown in the patent in the form of loops and made in the model as flat metal hooks, are they?

A. Yes.

C. Q. 251. Why didn't you make them like the patent?

A. The parts I used were already made, and sufficiently show what it is my desire, with limited time, to illustrate—that is, simply a convenient way of connecting the leather cover to the two elastic metal springs—and my purpose would have been shown just as well if I had used string, strapping buckle, wire, or any other loose or yielding attachment by which the leather may be suspended from the two sp-ings.

C. Q. 252. The patent shows the upper ends, the uprights, turned over with the loops *a* passing through them instead of a loose detachable hook connection, such as you have made in the model. Was that difference intentional or accidental?

A. Unintentional.

657 C. Q. 253. Wasn't the hook connected to the rear of the seat in the model made and attached instead of being something you picked up?

A. I think not. I think it was a hook like the forward one—flattened out and riveted to a piece already made for another style of saddle.

C. Q. 254. Is the upright steel bar B on the front of the saddle shown in the Bishop patent substantially the same as the upright post C shown and described in the Lillibridge patent, No. 294,645, and dated March 4, 1884? I see in both patents the front of the saddle seat is connected to these uprights by means of a loop. In the Bishop patent the loop passes through an eye in the upright, while in the Lillibridge patent the loop passes through a notch in the upright, making it detachable, more like the Bishop model you have produced. If these two uprights are substantially different explain why.

A. The question contains an assumption and is a combined question. Witness desires that it be divided and the *the* assumption removed.

C. Q. 255. What is the assumption?

A. That you see in each patent a different means of connecting the leather seat.

C. Q. 256. Don't you understand the question that you have declined to answer?

A. Yes; but my answer is liable to be misunderstood or misconstrued, but if the counsel demands an answer liable to be misunderstood I will make the answer.

C. Q. 257. You decline to answer it, do you?

A. Not by any means. I am waiting for the counsel to demand it should be answered.

C. Q. 258. I've asked you to answer it twice, and do so again. Please answer it.

658 A. In the first place, the upright steel bar in the front of the Bishop saddle is not substantially the same as the upright post marked C in the Lillibridge patent, 294,645. What the counsel has stated about the connections of the saddle to the spring in front of the Bishop saddle or the post in front of the Lillibridge saddle makes no difference and bears no relation to the uprights, but the uprights are substantially different, the one being a fixed post with notches to adjust the saddle's height and the other being an elastic post without any provision for changing its height.

C. Q. 259. Then the Lillibridge post is not substantially the same as the front spring of the Kirkpatrick patent, is it?

A. In adjustable features it is not.

C. Q. 260. Is it in any of its features, especially the rigid feature?

A. It is, in being a support for the front end of a flexible saddle.

C. Q. 261. And in that respect they are both like the front upright bar of the Bishop patent, are they?

A. They are.

C. Q. 262. Is the rear spring B in this patent, 294,645, substantially the same as the rear upright elastic bar B which supports the rear end of the seat in the Bishop patent? And if there be a substantial difference between them explain it.

A. The spring of the Lillibridge saddle is not the same as that spring described in the Bishop patent, for the latter has no provision for altering the height of the seat by the curved or circular form of its lower end, and because the spring of the Bishop patent does not extent forward from the seat before it makes a turn underneath the saddle.

659 C. Q. 263. What curve at the lower end of the rear spring of the Lillibridge patent do you refer to as making it substantially different from the rear upright of the Bishop patent? Designate it by letter if it be so designated in the patent.

A. The part marked *b'* and the part marked *b*. They constitute what Lillibridge terms the "foot portion."

C. Q. 264. It is your opinion, then, is it, that the Kirkpatrick devices shown in the saddle, its seat, its front and rear springs, their attachments and adjustments, are substantially the same as those shown in the Bishop patent, while the corresponding parts in the Lillibridge patent are substantially different, for reasons which you have heretofore given in your direct and cross examination? Is that it?

A. No. I did not testify in any such way. My answers are wrongly interpreted. The question of attachments was not entered into by me — all, and the adjustments I never said were the same,

but all have some elements that are common to each one, which I have attempted to make very clear in my previous answers.

C. Q. 265. You now seem to think that the fact that a spring curves back under itself, as shown at the upper end of the rear spring in the Lillibridge patent, makes it essentially different from the rear elastic upright bar B of the Bishop patent. Did you have that in view when you exaggerated the outward curve of that upright in making the Bishop model and lengthened it, as illustrated?

A. The answer to the first part of the above question is yes; to the latter part, no.

C. Q. 266. How essential is it that bicycle seats should be of the hammock-seat construction?

A. It is not essential.

660 C. Q. 267. They would sell just as well to have a rigid iron frame, would they?

A. Yes; just as well for racing purposes; but such frames are often preferred to any other.

C. Q. 268. What are such seats termed in the trade?

A. Saddles. There is no particular name for them.

Recess.

C. Q. 269. Do you claim to make your saddles that you use on the "American Champion" and "American Light Champion" under and in accordance with "Defendant's Exhibit Duryea Patent"?

A. No; I do not.

C. Q. 270. Did not you so testify in your direct examination?

A. I think not.

C. Q. 271. Do you make them under any patent; and, if so, what one?

A. Lillibridge.

C. Q. 272. Do you own the Lillibridge?

A. The defendants do.

C. Q. 273. When did you buy it?

A. About the month of May, this present year.

C. Q. 274. Look at page 119 of your direct testimony, where you name the Duryea patent and appear to quote from it, and state whether that quotation is from the Duryea patent and whether the statement there made that you have been making saddles in accordance therewith is correct, and also state what machines you use said saddles on, if any.

A. The quotation is not from the Duryea patent, but a quotation from the Kirkpatrick patent. The saddles we have made in

661 accordance therewith have been sold separately—that is, without any bicycle—and they have been sold with the bicycles defendants have made. There is no statement on page 119 that the Duryea patent is used in the exhibits except that the Duryea springs are independent in their adjustment, such adjustment, however, not being made use of in the "Complainant's Exhibits Defendant's American Champion" and "American Light Champion" Bicycles.

C. Q. 275. What are the separate springs lettered in the Duryea patent?

A. The springs are not lettered separately, the letter E denoting one continuous piece of elastic metal. The center part, being held by clamps, secures the elastic bar so that it cannot spring at that point and can only spring in front of and in the rear. The front part of this elastic bar is adjusted by the screw *h* and is the front spring. The rear part of the bar adjusted by the rear adjusting screw, also lettered *h*, is the rear independent spring.

C. Q. 276. Please explain to the court as lucidly as you can how far you could move one end of the bar by means of the front adjusting screw *h* that you have spoken of without loosening the rear adjusting screw *h* and at the same time moving or adjusting the rear end of the same bar.

A. By end of the bar I assume you mean one end which the leather is attached to as distinguished from another end of the bar to which the other end of the leather is attached. Now, the adjusting screw in front is evidently capable of depressing the forward end that the leather is attached to, and the elasticity of the metal will make it return when the set-screw is released, but whether the front screw is tightened or not and the front spring depressed
662 or not the rear screw will depress the rear spring in the same manner as I have stated the front spring to be depressed. The action of both those screws and their action on the front and rear spring is entirely independent.

C. Q. 277. Isn't this spring that you have called two springs lettered in the patent and called the supporting spring E in the patent?

A. It is.

C. Q. 278. And is one continuous rod or bar extending from front to the rear or from one end to the other of the seat, is it not?

A. It is.

C. Q. 279. You think there is nothing misleading in calling it two springs and saying that each is capable of a separate adjustment, do you?

A. No; I do not consider my description of them misleading.

C. Q. 280. Doesn't the defendant use rubber handles on some of its velocipedes?

A. They do.

C. Q. 281. With a ball of rubber at the end of the handle?

A. No.

C. Q. 282. Isn't there a ball of rubber on the handle of the bicycle marked "Complainant's Exhibit Defendant's Ideal Bicycle"?

A. No; there is not.

C. Q. 283. Isn't there connected with the enlarged rubber ends on the handles of that exhibit a rubber sleeve extending well onto the handle, made in one piece with enlarged end or ball?

A. The word "ball" doesn't describe anything found about
663 the handle of the exhibit. The handle that is there is of common tool-handle form and made of rubber. There is no sleeve in this handle.

C. Q. 284. Is there substantially a sleeve there and substantially a rubber ball, constituting those handles on the exhibit?

A. No; there is not.

C. Q. 284½. If there had been such a rubber handle as the rubber handles shown on that exhibit bicycle shown in a patent prior to the Moran patent, marked "Complainant's Exhibit Moran Patent," you would not have considered it substantially or sufficiently like the rubber handles shown and described in the Moran patent to have made any difference with the novelty or validity of the patent, would you?

A. There has been a rubber handle shown in a patent prior to the Moran patent, but such prior patent shows an entirely rubber handle and is different from the Moran patented handle, which contains novel features and elements not shown in the prior patent, and I do not consider the Moran patent invalid.

C. Q. 285. Do you understand my last question?

A. It is possible I do not.

C. Q. 285½. I asked you nothing as to your opinion, such as you have given in your answer. I will repeat the question in a different form and ask it of you as an expert and desire that you may, if possible, answer the question asked instead of giving your opinion about something not inquired about.

If there had been a patent of prior date to the Moran patent showing identically the handles which are on the bicycle exhibit marked "Complainant's Exhibit Defendant's Ideal Bicycle" would such a patent in any way, in your judgment, have affected the
664 novelty of the handle or the validity of the Moran patent, marked "Complainant's Exhibit Moran Handle Patent"?

A. No; it would not. It would simply limit and define its meaning.

C. Q. 286. Those handles on the bicycle exhibit are the same rubber handles that you used when you were paying royalties to the Pope Company or paying it money under the Gormully license contracts, are they not?

A. No and yes.

C. Q. 287. You mean by that that you made them part of the time while you were paying royalties, do you?

A. Yes; the first part of the time we used a wooden handle somewhat like the one Moran describes, having a rubber coating, and later made the handle of solid rubber.

C. Q. 288. When did you commence making treadles like those shown on "American Champion" and "American Light Champion" as distinguished from those shown on the "Ideal" exhibit?

A. I think about two years ago we commenced to put them on the market.

C. Q. 289. Did you put them on any class of bicycles before you commenced making the "American Champion"?

A. I am not quite sure as to that point. I think, however, that we did.

C. Q. 290. How do you solder the handle bar?

A. Put it in the head at the central straight portion between the two right and left curves.

C. Q. 291. Do you have any projection or pin?

A. Not to center the handle bar. There has been, how-
665 ever, this season a pin driven into the head and into the handle bar, fitting and made to center a hole drilled in the handle bar, to prevent the handle bar which we now make from turning.

C. Q. 292. Does it prevent it from slipping endwise also?

A. It aids a little.

C. Q. 293. Is it at the center of the handle?

A. Or the handle bar; yes.

C. Q. 294. Aside from this hole, the handle bar is of the same size and strength and without shoulders or projections between its ends?

A. The handle bar is tapered or reduced towards its ends, but it has no shoulder.

C. Q. 295. When did you make this Exhibit "American Champion"? I mean this identical machine.

A. I do not know.

C. Q. 296. Can't you tell by looking at it what year you made it?

A. No; I cannot tell whether it was made the early part of this year or the latter part of last year.

C. Q. 297. Do you think a man does not infringe the Serrell patent unless he drives nails through the rubber tire?

A. No.

C. Q. 298. Do you think cement would answer if one desired to use some means of fastening besides the contractile force of the rubber to hold it in its groove?

A. I know it will hold the rubber securely, whether contractile or not.

C. Q. 299. Were you using cement as a fastening when the court enjoined you from using rubber tire wheels?

A. No.

666 C. Q. 300. Never used any before that time, did you?

A. Yes; I used cement for sticking tires in wheels.

C. Q. 301. How long ago?

A. For the last eight years.

C. Q. 302. How long has cement been well known as a means of fastening, do you think?

A. A hundred years or more.

C. Q. 303. About as long as nails, do you think?

A. Very likely.

C. Q. 304. Don't you know, Mr. Jeffery, that at the time you took your license there were royalties being demanded and paid under the patents then owned by the Pope Manufacturing Company and concerning which you have testified in this suit?

A. Regarding the toy-horse patents and the Lallement crank patent, royalties were paid, but no one had at that time, I think, succeeded in unearthing and making prominent the Serrell patent, and its existence was not known except to a very small number.

C. Q. 305. How large royalties were the largest formerly paid under the Lallement & Reynolds patent, as you understand it?

A. I do not know. I have understood that ten dollars was the royalty demanded for the manufacture or importation of any man-sized machine, without regard to what patents or whether any patents were used.

Re-direct examination by C. K. OFFIELD, Esq.:

R. D. Q. 1. Look at the two papers now shown you and state what they are.

A. One is a license from the Pope Manufacturing Company to me. The other is an injunction order.

667 R. D. Q. 2. Is this the license under which suit was brought and the injunction served as you have testified?

A. It is.

(Defendants' counsel here offers in evidence the two papers just testified concerning by the witness and requests that they be marked respectively Defendant's Exhibit Jeffery License and Defendant's Exhibit Jeffery Injunction.

R. D. Q. 3. I see that the last of the patents in this license expired in '85 and '86, namely, Calvin Witty and the Reynolds patent of July 28, 1868. Did you ever use the inventions of either of these patents or did the Pope Company ever claim you did?

(Question objected to, as the license and payment of royalties is the best evidence.)

A. I never used them, and the Pope Company never claimed that I did.

R. D. Q. 4. When you took this license did the Pope Company own or control the Serrell patent on a rubber tire or claim to own or control it?

(Objected to as not being the best evidence.)

A. They did not.

R. D. Q. 5. While you were in partnership with Mr. Gormully were any of the bicycle or tricycle structures then manufactured marked or identified in any manner with the letters patent or any of them set out in any of the Gormully licenses, or would you have them so marked?

A. No; they were not marked as manufactured under any of those patents owned by the Pope Company. If I so marked them I should have been committing a fraud.

R. D. Q. 6. Did you ever send any sum of money whatever to the Pope Manufacturing Company except under direction of Mr. Gormully?

668 A. Not after Mr. Gormully became a licensee.

R. D. Q. 7. Did your stay in partnership with Mr. Gormully upon any other ground or assurance from him except to the end and effect that all relations of his would be severed from the

Pope Company and all contracts or writings at an end between them on April 1, 1886?

(Objected to as leading.)

A. I did not, except with this assurance.

R. D. Q. 8. I call your attention to the apparent uneasiness displayed by complainant's counsel over the fact that the nut of "Defendant's Exhibit Model Allcott Bearing Patent" has a milled edge, and the rollers and proportions seem to be the subject of his criticism, and will ask you if you will make and introduce as a part of your deposition and under the identification name of "Defendant's Exhibit Model Allcott Bearing Patent No. 2" an exact and precise model of this Allcott patent, so that it cannot be distinguished from the same when examined through a microscope or telescope?

A. I will.

Adjourned to Wednesday, August 31, 1887, 9.30 a. m.

WEDNESDAY, *August* 31, 1887—9.30 a. m.

Met pursuant to adjournment.

Present: Same as before.

Recross-examination by L. L. COBURN, Esq.:

R. C. Q. 1. Were there advertisements in the Bicycling World, a trade journal that was published at one time as the official organ of the League American Wheelmen, in which it was advertised to the trade that the firm of Gormully & Jeffery manufactured under licenses from Pope Manufacturing Company?

A. There might have been; but, if there was, such ad-
669 vertisement was inserted without my knowledge or consent, and such statement about license was misleading.

R. C. Q. 2. Was there such an advertisement published in a journal called "The Wheel," a trade paper published in New York?

A. I do not know.

R. C. Q. 3. Was there such a statement in the catalogue or circulars used by the firm of Gormully & Jeffery to advertise their business?

A. Such statement might have been in all those publications, but if such was the case it was done without my consent.

R. C. Q. 4. Don't you know that it was in the catalogue or circulars of the firm?

A. No; I do not. I remember that Mr. Gormully inserted it in his catalogues, but when I obtained an interest I am of the opinion that this was discontinued, but am not sure that the statement was so discontinued. The firm never having been licensed by the Pope Manufacturing Company, a statement that it was licensed by that company was untrue.

R. C. Q. 5. And it is now your opinion, is it, that it would have been untrue and a fraud upon the Pope Manufacturing Com-

pany, as well as upon the trade, to have advertised or represented that your machines which were made in 1884 were any of them made under licenses or a license from the Pope Manufacturing Company?

A. It is my opinion that the statement was untrue and a fraud instigated by the Pope Manufacturing Company upon Gormully and upon the trade in causing him to advertise those machines that any one in the United States not a licensee had an absolute right to make at that time.

670 R. C. Q. 6. When will you produce your amended Allcott model that is to be marked No. 2 under that patent, and will you show it to me before it's introduced?

A. On September 2d next I will do as you desire.

THOS. B. JEFFERY.

Subscribed and sworn to this 31st day of August, A. D. 1887, before me—

FREDERICK C. GOODWIN,
[SEAL.] *Notary Public.*

Defendants' counsel now calls as a witness in their behalf R. PHILIP GORMULLY, who, being first duly sworn to state the truth, the whole truth, and nothing but the truth, deposes as follows in answer to interrogatories propounded to him by C. K. OFFIELD, Esq.:

Q. 1. Please state your name, age, residence, and occupation.

A. R. Philip Gormully; forty; Chicago, Illinois; manufacturer and merchant.

Q. 2. Are you the defendant or one of the defendants in the several suits brought by the above-named complainant against you individually and against you and Thomas B. Jeffery and against you, Thomas B. Jeffery, and the Gormully and Jeffery Manufacturing Company on certain patents and contracts?

A. I am.

Q. 3. How long have you been acquainted with your codefendant, Thomas B. Jeffery?

A. About thirty years.

Q. 4. Do you know the corporation complainant in this case; and, if so, how long have you known it?

671 A. I know them; have known them something less than five years, I think.

Q. 5. Do you know the corporation defendant in this case; and, if so, what business or official relation or both do you hold towards that corporation?

A. I know the corporation and am officially connected with it as president.

Q. 6. What, principally or exclusively, is the business of this corporation defendant?

A. Principally the manufacturing of bicycles and tricycles.

Q. 7. What is the business, principally, of the corporation complainant?

A. I believe the manufacturing of bicycles and tricycles and the collecting together, by purchase or otherwise, of letters patent and endeavoring to extract or collect royalties by means best known to themselves from other makers.

Q. 8. Please state fully and without detailed questioning when, where, and under what circumstances you first became acquainted with this corporation complainant.

A. Some time in 1882 I received a letter from the complainant corporation to the effect that they had noticed some business advertisements pertaining to my business—the manufacture of bicycles—and in this letter they claimed that I had advertised simply to attract their attention. I think this letter also stated that they owned certain letters patent, and I think, at the same time, that they desired or wished me to take a license from them.

Q. 9. When, where, and under what circumstances did you first engage in the manufacture of bicycles?

672 A. In the year 1882, in the city of Chicago, after having purchased the business originally conducted or owned by Mr. Thomas B. Jeffery.

Q. 10. Did you purchase the entire business, plant, and interest of Mr. Jeffery at that time?

A. I purchased all the stock and material and good will of the bicycle business from Mr. Jeffery.

Q. 11. What did Mr. Jeffery do at and after the time you purchased his bicycle business?

A. He worked for me.

Q. 12. At the time you purchased Mr. Jeffery's bicycle plant and business were you familiar with the practical construction and details in the manufacture of bicycles so that you could personally carry on the manufacture without a skilled foreman or competent assistant?

A. I was somewhat acquainted with the practical working of the business, but it was absolutely necessary that I should employ a skilled mechanical foreman or assistant.

Q. 13. Did you know Mr. Jeffery to be such when you employed him, and did he work for you in that capacity?

A. I did, and he did.

Q. 14. You have spoken of a demand made upon you in 1882, upon the part of the Pope Company, complainant, that you take license from them under certain patents which they owned or controlled. Did you take such license?

A. I did, after a very large amount of correspondence and at their urgent request and wish, many months after our first correspondence.

Q. 15. Please look at "Complainant's Contract Exhibit No. 1" and state whether this is the license just referred to and if this is the first contract of license executed between yourself and the complainant.

673 A. It is.

Q. 16. What statements or threats, if any, were made against you or your business by this complainant, based upon a failure

or refusal upon your part to execute this "Complainant's Exhibit Contract No. 1"?

(Question objected to for the reason that the witness has stated that their communications were in writing, in the form of correspondence, and the written evidence is the best evidence; also because the general construction in general terms of any communications between the parties, such as he has given in some of his prior answers and such as the counsel evidently seeks to give in the form of his question, is incompetent, immaterial, and is objected to on that account, and because it is not a production of facts leaving the construction and conclusions to be drawn and arrived at by the court.)

A. After receiving their first letter I wrote them that I was willing to enter into an agreement with them on certain conditions. They, in reply, seemed anxious for me to take a license—in fact, expressed a strong wish to issue a license. Then we corresponded as to terms and prices of royalty, but could not agree. Finally they wrote me that the matter was of so much importance to them that they thought if a personal interview could be arranged that they could satisfy me and make matters pleasant for me, and offered to pay one-half my expenses if I would visit them, and finally offered and did pay the whole of my expenses to visit them in Boston, which, I think, occurred in February, 1883. Whilst there they talked to me of the proposed license, saying they absolutely
674 controlled the business by some ten or eleven patents which they claimed to own, and that it would be better for me to take a license; if I did not, they would sue me, saying it would cost several thousand dollars—such suit—and that my business would be ruined meanwhile, and it ended in my not taking a license at that visit; but, I think, prior to this visit I had told them that if I used any of their patents and they could prove it that I would pay them, and as I knew the Lallement patent, one of those claimed to be owned by the complainants, would expire in November, 1883, and thinking this was one of their strongest patents—in fact, I believe it was this patent that they started in business with—and, foreseeing its early expiration, I decided not to contest this patent, and agreed with them to pay them five hundred dollars ($500) to cover future royalties on certain machines I was then making and which I was to sell during the time we were negotiating for license. After their receiving this money and after our interview in Boston I returned to Chicago to think and consider over what they had formulated for a permanent license. They waited, I think, some few weeks, then began to stir me up, saying if we couldn't agree on a permanent license that I should at least sign a special license for the machines I was then manufacturing. They were willing to make most any terms on this special license, saying I could strike out certain clauses to suit my views, of which I noted some of the clauses that they agreed in writing to strike out are not stricken out. They also claimed that they were in a very awkward position in allowing me to make bicycles without a license; then they threat-

ened me with suits; then they sent a representative to Chicago with full powers to act (I think this was in June, '83), and,
675 to the best of my memory, we arranged a license, what was then called, between us, as a permanent license, and I think after that license was arranged and signed that the license now shown me and marked as "Exhibit No. 1" was signed.

(Answer objected to for reasons given above and for the reason that the written contract is the best evidence as to what the agreement finally was between the parties; also for the further reason that what the witness "thought," "believed," "foresaw," etc., is immaterial and not competent evidence.)

Q. 17. "Contract Exhibit No. 1" is dated June 13, 1883. Was this paper mutually executed and delivered between the signatory parties thereto at that date?

A. It was under protest from me, as I told them that I did not see the use of signing this document after having arrived at a conclusion for another one, but they claimed it was a matter of form; that this was to cover the machines made prior to this time and for which they had been paid five hundred dollars ($500), so I finally signed it, virtually to oblige them, and did not look carefully into it to see that it was in conformity with our previous understanding.

Q. 18. Who represented the complainant in this transaction?

A. Mr. Charles E. Pratt.

Q. 19. What was Mr. Pratt's relation to the complainant at that time?

A. I believe he was the attorney for the complainant.

Q. 20. Were you represented by or had any attorney with you in this trausaction?

A. No; I had none present.

676 Q. 21. I see "Complainant's Contract Exhibit No. 2" bears date June 13, 1883, the same as No. 1. Did you execute No. 2; and, if so, when?

A. Yes; on the same day as No. 1.

Q. 22. Were these contracts, Nos. 1 and 2, mutually delivered *to* each party to the other upon June 13, 1883?

A. I think so; yes.

Q. 23. I see by a distinct covenant in these contracts, Nos. 1 and 2, that they are not transferable. Did you ever transfer them or any part or interest in them?

A. No.

Q. 24. Please look at "Complainant's Contract Exhibit No. 3" and state if you executed the same and if it was executed on its face bearing date December 1, 1884.

A. I executed it, but I am not sure as to the date being correct. It was about that time.

Q. 25. I see by an examination of this Exhibit No. 3 that the printed matter, referring to the time when the paying of royalties should cease, namely, the 21st day of November, 1894, has been erased and the 1st day of April, 1886, substituted therefor. To what purpose and end was this erasure and substitution made and in-

serted in that contract and so understood between the parties prior to the execution?

(Question objected to, as the contract is the best evidence and because an understanding is asked for.)

A. The Exhibit No. 3, when first presented for signature to me, had not had the words "21st day of November, 1894," erased. I objected and declined to sign it unless they erased those words and inserted the words "1st day of April, 1886," as this was mu-
677 tually understood to be the absolute end of the contract in all its provisions.

Q. 26. Why did you refuse to enter into "contract No. 3" unless it was made to terminate absolutely upon April 1, 1886, in all its terms and conditions?

(Question objected to for reasons given above.)

A. Because all the patents owned by the complainants at that time that were necessary in the construction of bicycles expired prior or about that time, and I objected to pay them either royalty or to have any agreement existing between us after that date.

Q. 27. Who executed "Complainant's Exhibit Contract No. 3" in behalf of the corporation complainant?

A. It was signed by Charles E. Pratt, attorney.

Q. 28. Did you have your negotiations with Mr. Pratt leading up to the execution of contract No. 3?

A. I think I did, most of them, to the best of my recollection.

Q. 29. Were you represented by any attorney in your interviews with Mr. Pratt or in your negotiations as to contract No. 3?

A. No.

Q. 30. State whether or not Mr. Pratt stated or represented to you or gave you to understand that the erasure of the words "21st day of November, A. D. 1894," and the substitution of the words "1st day of April, A. D. 1886," would absolutely terminate and end this contract in all its terms, stipulations, admissions, and conditions as contended for and insisted upon by you before you would execute it.

(Objected to as leading and otherwise entirely improper in form, and also as to substance.)

A. I so understand it, and I also understood that if I
678 should wish to return the contract and cease paying royalties prior to that time that the contract would still be in force until that date, April 1, 1886.

Recess.

Q. 31. We notice that it is provided in "Complainant's Exhibit Contract No. 3" that it is not transferable. Did you ever transfer it or transfer any interest in it to any party whatever?

A. No.

Q. 32. I call your attention to "Complainant's Memorandum

Agreement No 4" and ask you for what purpose this memorandum was made.

(Question objected to.)

A. Knowing that the contract marked Exhibit No. 3 expired on the 1st day of April, 1886, and noticing the following words in the eleventh clause, "And it is agreed that at the termination of the license herein contained at any time by expiration the party of the second part shall pay the within-named royalty on all said herein-licensed machines or parts of machines, whether wholly finished or not," I noticed this clause early in November, 1885, at which period of the year manufacturers of bicycles commenced to build and get goods ready for sale early in the spring of the next season, and fearing that complications might arise as to what they might claim—what were parts and pieces subject to royalty—I went to Boston and talked this matter over with them, and they agreed to receive the amounts as stated in their Exhibit No. 4, which amount was understood and received by them to be an absolute settlement of all and every claim that they had under this contract Exhibit No. 3. At the same time,
679 in a conversation with Albert A. Pope, president of the complainant company, he stated he did not see why I wished to cut loose from them at the termination of this contract, and said he was very sure that I should be very glad to stay with them the coming year. I told him I saw no reason for continuing any longer with them, as I did not know of any patents that they owned that would be of use to me in the conduct of my business, and that I did not see that they could give me any protection which would be of any value to me in the future.

(Objected to for reasons given above.)

Q. 33. State whether or not the complainant corporation, through its officers, ever admitted or stated to you that they would have no claim against you under any patents owned by them after April 1, 1886.

(Objected to as leading and improper in form.)

A. They did, both by letters and verbally, and this fact was always in my mind and recognized by them in all our dealings.

Q. 34. Have you any letters received from the Pope Manufacturing Company which refer to the fact that you did not and would not recognize any of their patents, or that you were bound by any of them after April 1, 1886, or were to be prejudiced by any license agreement with them after such date?

A. I have.

Q. 35. Please look at the letters now shown you, addressed to you by the Pope Manufacturing Company, either by its president, Mr. Pope, or its attorney, Mr. Pratt, dated respectively March 17, 1883, May 4, 1883, October 24, 1884, November 4, 1884, November 20, 1884, and state whether these letters are all signed by the parties professing to sign them and whether they were received by you in

due course of business with the complainant about the dates indicated thereon respectively.

(Objected to as immaterial and irrelevant.)

680 A. Yes; and they were received by me in the regular course of business.

(Defendants' counsel here offers in evidence the letters referred to by the witness and requests that they may be identified with this record and marked respectively "Defendant's Exhibit Complainant's Letters, March 17, '83, May 4, '83, Oct. 24, '84, Nov. 4, '84, and Nov. 20, '84.")

(The introduction of these letters is objected to—first, because they are not the best evidence with reference to existing contracts, and should not be used to in any way modify the terms and conditions of contracts in writing that were afterwards entered into between the parties; second, because it appears from the testimony of this witness that there were negotiations pending and terms proposed and rejected by both sides which simply served to lead up to the making of these contracts; consequently any such propositions or terms are not material evidence in reference to said contracts; third, because *that* their letters have been selected without giving the full correspondence and negotiations that was carried on between the parties, but only a part of it, and, fourth, because they are immaterial, irrelevant, and improper evidence under the issues in this case.)

Q. 36. Did you ever obtain letter-press copies of any letters written by you to the complainant- and assented to by them which refer to and show that all contracts and all covenants and admissions by either party were to be at an end April 1, 1886?

(Objected to as immaterial and as leading and improper in form.)

681 A. Yes.

Q. 37. Please look at the letter-press copies of the several letters now shown you, signed by you and addressed to the Pope Manufacturing Company, and state whether or not the original or fac-simile duplicates of these copies were addressed by you, postage prepaid, in due course of business to the Pope Manufacturing Company, Boston, Massachusetts.

(Objected to for reasons given above.)

A. They are and they were.

(Defendants' counsel here offers the letters in evidence and requests that they may be marked "Defendant's Exhibits Gormully's Letters of March 12, '83, May 1st, '83, June 23d, '84, Oct. 20th, '84, Oct. 29th, '84, Nov. 12, '84, Nov. 28th, '84.")

(Objected to for reasons given above.)

Q. 38. Please state whether or not Mr. Thomas B. Jeffery ever had any interest in any manner, shape, or form or ever recognized in any manner, shape, or form any of the three contract exhibits between you and the corporation complainant.

A. No; and they recognized that fact, as all correspondence on this subject was always addressed to me personally.

Q. 39. Did Mr. Jeffery at any time while associated with you, either as employé or copartner, ever recognize or admit that the complainant owned or controlled any letters patent which were valid and which covered any bicycle or tricycle structures during that time?

(Objected to as leading.)

682 A. He never admitted the validity of any of the complainants' letters patent, but always held that they were worthless and if contested would not be worth the paper they were written on, and he furthermore informed me that I had never made or sold a bicycle containing any of the so-called patents or claims.

(The last part of the answer objected to as a piece of voluntary evidence on the part of the witness and not responsive to the question.)

Q. 40. Had Mr. Jeffery any knowledge of all the covenants and agreements of these three personal licenses appearing as exhibits in this case which you saw fit to negotiate with the complainant, and in what manner did Mr. Jeffery obtain whatever knowledge he had of those licenses?

(Objected to as leading.)

A. He did not have knowledge of all the covenants and agreements. I think whatever knowledge he had was obtained from conversations with me.

Q. 41. Who furnished substantially, if not wholly, the money or capital upon which the firm of Gormully & Jeffery did business?

A. I think I did. At least I furnished all the extra capital required, upon which the firm paid interest.

Q. 42. Did you ever receive any letters from the complainant during the existence of any of these three license contracts which showed that the complainant had full knowledge of the opinion and attitude of Mr. Jeffery regarding their patents?

A. Yes.

Q. 43. Look at the two letters now shown you and state if they are two letters received by you from the Pope Company on or about the inscribed dates partially as to this matter.

(Objected to as leading and as improper in form.)

683 A. They are.

(Defendants' counsel here offers in evidence the letters referred to and requests that they may be marked "Defendant's Exhibit Complainant's Letters of November 23, 1883, and December 7, 1883.")

(Objected to for reasons given above.)

Q. 44. When did you first begin to manufacture and sell bicycles or tricycles having ball bearings substantially as shown in defendants' bicycles in evidence in this case openly and avowedly to the trade?

A. In the year 1884.

Q. 45. State whether or not you advertised them openly and whether or not such manufacture and sale of bicycle and tricycle machines was well known by this complainant during the years 1884, 1885, and 1886.

(Objected to as leading, and because I am of the opinion that the court would prefer to have the witness give a little testimony instead of swearing to the statements of counsel by simply saying "yes" or "no," as the form of the question requires.)

A. Yes; I manufactured bicycles with ball bearings to the wheels and published the fact openly to the trade by a printed catalogue and did all in my power to have it extensively known, and I am sure that the complainant's corporation were very fully aware of the fact, as they had surely received catalogues published by me and sold such goods of my manufacture to their customers with full knowledge that they contained ball bearings during the period named.

Q. 46. Defendants' counsel, appreciating that the alleged
684 objections of complainant's counsel arise primarily from a desire to mitigate the force of the facts rather than to the form of the question, now shows the witness six letters or orders directed to Mr. Gormully, four of them being signed by the Pope Manufacturing Company and the other by W. M. Durell, and covering the years 1884, '5, and '6, and asks whether or not these are some or samples of letters and orders received from the Pope Company or its agents at the dates indicated in the letters for ball-bearing machines.

(Objected to as leading.)

A. They are.

Q. 47. Have you one of the catalogues published by you and circulated to the trade in 1884, advertising and showing these ball bearings?

A. I have.

(Defendants' counsel here offers in evidence the catalogue referred to by the witness and the six letters or orders identified by the witness and requests that they may be marked respectively "Defendant's Exhibit Jeffery 1884 Ball-Bearing Catalogue" and "Defendant's Exhibits 1884, '5, and '6 Ball-Bearing Orders," such orders for further complete identification being dated May 2, 9, and 27, 1884, July 14, 1885, and November 22, 1886.)

Adjourned to Thursday, September 1, 1887, at 10 o'clock a. m.

THURSDAY, *September*, 1, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

Q. 48. Mr. Gormully, when did you make up your mind, so far as you are concerned, to assist in aiding or taking part in the formation of the present corporation defendant?

685 A. I think in the summer or fall of 1885 I first thought of aiding in forming defendant corporation. I remember at that time meeting Albert A. Pope here in Chicago and driving with him through the parks, and mentioned the subject to him, and he thought it would be a good thing and said he would like to buy some stock in such corporation if it was formed. After that I talked with other friends and thought the matter over during the winter of '85 and '6, and I think in the spring of '86 fully decided to aid in forming such corporation. During the summer of '86 I went to Europe, but upon my return the necessary steps were taken and the subscription list signed and the company formed, in accordance with the law, early in October, '86.

Q. 49. Have you one of the preliminary papers relating to the formation of the corporation defendant; and, if so, will you permit this paper to be entered as an exhibit in connection to your deposition?

A. I have; and, if necessary, will, but would prefer a copy go in.

(Defendants' counsel here offers in evidence letter-press copy of the above paper and requests that it may be marked Defendant's Exhibit Notice Incorporation of Defendants Corporation.)

(Objected to as immaterial and on account of the erroneous name given the paper, being simply a notice of a meeting to be held.)

Q. 50. I see by the answer to question 10 given by complainants' attorney, Mr. Pratt, in his deposition, that he attempted to convey the impression to the court that you aided in forming this corporation for the purpose of escaping or avoiding some possible liability upon your part by reason of these expired personal contracts
686 of yours of April, 1886, with the Pope Company. How is this?

(Objected to because its assumptions are erroneous and because it is leading.)

A. It was not so. As I before stated, I had been considering the matter, with the Pope Company's full knowledge, at least twelve months prior, and when I decided finally with others to form the corporation there was not the least doubt in my mind as to the contract referred to had absolutely expired at the date, April 1, 1886, and that the payment I made them in July, 1886, was in full for all claims they might have had for parts and pieces manufactured prior to April 1, 1886, by defendant corporation; so that, knowing this fact, it could not possibly have been formed for the purpose that Mr. Pratt suggests in his evidence.

Q. 51. Since the 1st day of April, 1886, state whether or not you have ever in any manner admitted the existence or force of any of the three contracts offered by complainants in evidence, in any of their terms, admissions, or conditions.

(Objected to as leading and immaterial.)

A. I think not, and have written them positively to that effect.

Q. 52. I see that the contracts provide that you may formally sur-

render such contracts. Did you ever, as a matter of form, surrender such contracts to the complainant corporation; and, if so, about when?

A. I did, and surrendered the contracts to the complainant corporation, through their attorney, Mr. Coburn, on January 4, '87. My reason for surrendering to Mr. Coburn was that complainant corporation had notified me to make all communications on this subject through their attorneys, Messrs. Coburn & Thacher, Chicago.

687 Q. 53. How great a sum of money did this complainant corporation get out of you and compel you to pay under contracts Nos. 1, 2, and 3 prior to April 1, 1886, for bicycles and tricycles manufactured by you prior to that date?

A. Between twenty (20) and twenty-five thousand dollars, to the best of my recollection.

Q. 54. How much money in all have you paid this complainant corporation by reason of its claims and threats under its alleged letters patent?

A. I think over twenty-seven thousand dollars ($27,000).

Cross-examination by L. L. COBURN, Esq.:

C. Q. 1. How long have you been in business in Chicago?

A. I think about twelve years.

C. Q. 2. What was your business in Chicago prior to 1882?

A. Manufacturing architectural iron-work for buildings; also in the slate business and metal-roofing.

C. Q. 3. Did you have a foundry?

A. No.

C. Q. 4. Were you in business on your own account and alone during that time?

A. Part of the time alone; part of the time with a partner.

C. Q. 5. All the time on your own account?

A. Part of the time on my own account alone; other time a partner.

C. Q. 6. Do you mean that you could not do business on your own account only when you were alone and not when you had a partner?

688 A. When alone I did exactly as I liked; when I had a partner I sometimes consulted with him.

C. Q. 7. Is that as well as you can answer that question?

A. I think it fully answers it; I think it does.

C. Q. 8. Do you think you have answered either of my two last questions?

A. I do.

C. Q. 9. Did you conduct business on your own account during that twelve years when you had a partner?

A. I conducted the business, as I before stated, sometimes with the advice of my partner.

C. Q. 10. On whose account did you conduct the business?

A. During the time I had a partner, on the account of myself and partner.

C. Q. 11. Well, not on your own account?
A. Partly on my own account.
C. Q. 12. Independently of your partner?
A. Some business; yes.
C. Q. 13. What business? The firm's business, do you mean, or do you mean a separate business that you did on your own hook?
A. Building business; a separate business, on my own hook and with others.
C. Q. 14. Of whom did you lease your building that you occupied with your sheet-metal cornice business in 1882?
A. I think Ogden, Sheldon and Company.
C. Q. 15. What was its number?
A. 228 and 230 Michigan street.
C. Q. 16. You had no partner there, did you?
689 A. Not in 1882.
C. Q. 17. At what time did you purchase Jeffery's velocipede stock?
A. I think it was in October or the fall of 1882.
C. Q. 18. How much did you pay him for it at that time?
A. Two thousand dollars ($2,000).
C. Q. 19. Where was his place of business?
A. 38 South Canal street.
C. Q. 20. You bought only his bicycle business?
A. Yes.
C. Q. 21. What other business did he have?
A. I think he had a model business.
C. Q. 22. Did he make up your work by the piece or by the month?
A. I don't understand the question.
C. Q. 23. He was in your employ, you have said. Now, in what way was he employed?
A. I don't think I have been asked the question before. He was employed by me as foreman and to assist me in running the business.
C. Q. 24. Did he do the work by the piece or by the month?
A. His services were paid for by the year, I think.
C. Q. 25. Did you pay the workmen or did he pay them?
A. I think my book-keeper paid the workmen.
C. Q. 26. You don't know certain about that, do you?
A. As a general thing, it is so. It is possible I may have paid myself sometimes.
C. Q. 27. What was Mr. Jeffery's salary?
A. I am not quite sure, but I think it was twelve or fifteen hundred dollars a year—at that rate.
690 C. Q. 28. Did you keep a separate account of that business distinct from your other business?
A. I did.
C. Q. 29. Where was that separate account kept?
A. In the office at Canal street.
C. Q. 30. Your other business office was on Michigan street?
A. It was.

C. Q. 31. How many men did you have employed on Michigan street at that time?

A. I do not remember. The number varied at different parts of the year.

C. Q. 32. Give about the average number.

A. At that time it might have been from ten to a hundred; anywhere.

C. Q. 33. Did you know at the time you made the purchase of Jeffery, as you have stated, that he had been sued for violating a contract by the Pope Manufacturing Company?

A. I do not remember that I did.

C. Q. 34. Don't you know there was a motion for an injunction pending against him at that time?

A. I do not remember that I knew there was.

C. Q. 35. After you made this purchase of Jeffery all of the mail and corresponce in reference to that business was received and conducted at the Canal-street office, was it not?

A. Virtually all of it. Later some correspondence from the Pope Company was addressed to my Michigan-street office.

C. Q. 36. Jeffery had no interest in the profits or business done in your name on Canal street prior to January 1, 1884, did he?

691 A. I think only the salary, except an interest in the patent weaving machine. I think he had an interest in that.

C. Q. 37. His pay that he received for his services did not depend in any way upon the amount of business done, did it?

A. No; his salary was fixed.

C. Q. 38. And he had no share in the profits of the business or in the stock on hand at any time during that time, did he?

A. I think not.

C. Q. 39. Did he become a full and equal partner with you in that business on January 1, 1884?

A. I don't think he was a partner at that time. I think it was in May, 1884, if I remember aright.

C. Q. 40. Did he become a full and equal partner with you on May 1, 1884?

A. He did.

C. Q. 41. How much did he pay you for a half interest in that business?

A. I think it was something over five thousand dollars that he put in the business.

C. Q. 42. Did he pay that for a half interest or did he simply put in five thousand cash as being equal to your interest in the business?

A. I think he put in machinery he possessed, and other things to that amount, which brought it up to about the same value that I already had in the business.

C. Q. 43. Was this machinery used in the manufacture of velocipedes and bicycles?

A. It was.

C. Q. 44. Was it used there in the shop on Canal street before he put it in as firm assets, as well as after, for that purpose?

692 A. It was used in the shop before he became a partner in the manufacture of bicycles and also after he became a partner.

C. Q. 45. Did you manufacture bicycles on your own account under the licenses that you held from the Pope Manufacturing Company after the firm of Gormully & Jeffery was formed?

A. I did.

C. Q. 46. Where?

A. I think on North Franklin street.

C. Q. 47. What number?

A. 222 North Franklin.

C. Q. 48. How many did you make there?

A. Don't know.

C. Q. 49. You can give an idea whether it was two or more, can't you?

A. More than two.

C. Q. 50. Did you have a regular factory there on Franklin street? Give the court something of an idea, if you can, about what you did there.

A. The firm of Gormully & Jeffery had a regular factory there for the manufacture of bicycles, etc.

C. Q. 51. About how many velocipedes or bicycles did you make there on your own account and not on the account of the firm of Gormully & Jeffery?

A. They were all made for the firm of Gormully & Jeffery; how many I don't know.

C. Q. 52. Were they all made by the firm of Gormully & Jeffery and with their machinery?

A. Yes.

C. Q. 53. And all accounts of their manufacture and sale were kept in the name of Gormully & Jeffery, were they not?

693 A. They were.

C. Q. 54. What were the names of the bicycles that the firm of Gormully & Jeffery made?

A. The "Ideal" in '84; the "Challenge" and "Ideal" in '85.

C. Q. 55. The "Challenge" was not made until after the license contract of December 1, '84—that is, this Contract Exhibit No. 3—was it?

A. I think not.

C. Q. 56. Did you make, personally and on your own account and entirely separate and distinct from your partnership relations with Jeffery, and sell any bicycles under the license marked "Exhibit No. 3," dated December, 1884?

A. No.

C. Q. 57. Did you make and sell any on your own account of the "Ideal" bicycles in 1884 or 1885, after the firm of Gormully & Jeffery was formed?

A. I did not.

C. Q. 58. What was the principal difference between the "Ideal" and the "Challenge?"

A. The "Challenge" was of a larger size, made correspondingly stronger and of a somewhat different material, I think.

C. Q. 59. In your contract No. 2 there was a restriction as to size and quality, was there not?

A. I think there was.

C. Q. 60. The "Ideal" conformed to that restriction, did it not?

A. I think it did.

C. Q. 61. Didn't you desire in 1884 to obtain the privilege of making a larger size than the "Ideal"?

A. I think I did.

694 C. Q. 62. And wasn't the contract No. 3 the outcome of that desire upon your part, which resulted in your entering upon the manufacture of the "Challenge"?

A. It was.

C. Q. 63. When did you commence making "American Champions"?

A. I think in May, '86; about that time.

Recess.

C. Q. 64. How early after May or in May, 1886, did the Pope Manufacturing Company notify you, complaining that the manufacture of the American Champion was a breach of your contract or contracts with it?

A. I think it was near the end of June—at least some time after they had made a settlement and combination with the Overman Wheel Company to control the bicycle business—that they wrote me claiming that the "American Champion bicycle" infringed some of their patents under the expired contract, shown as "Exhibit No. 3."

C. Q. 65. You have not meant in your last answer to use the language of the letter referred to, have you?

A. I think some portion of it.

C. Q. 66. What portion of it?

A. I don't think in that letter that they told me that they had settled and combined with the Overman Wheel Company, but I think they referred to certain patents which they claimed to own, and I think a number of them had expired.

C. Q. 67. About when did you commence negotiations with the Pope Company for another license? I refer now to the negotiations that terminated in my office late in the fall of 1886, after I gave you the ultimatum as to terms upon which you could have such a license.

695 A. I do not remember negotiating with the Pope Company for another license. We had what was called a conference to form an alliance for the general good of the business. I think that meeting was held in the end of October, 1886, at Boston.

C. Q. 68. You wish the court to understand by your answer, do you, that you had no negotiations by correspondence or otherwise

during 1886 in reference to your taking a new license from the Pope Manufacturing Company under patents then owned by it?

A. I would explain to the court that I received a number of threatening letters, both from the Pope Manufacturing Company and the Overman Wheel Company, from which I inferred that they wished to bulldoze me into taking licenses from both of them.

C. Q. 69. I call your attention to the fact that you have not answered my last question, and also to the fact that I asked you nothing about the Overman Wheel Company or what you inferred from their letters, and request that my last question be reread to the witness, and that he answer it or decline to do so.

A. I have stated, to the best of my recollection, what was the substance of the letters or correspondence.

C. Q. 70. Then you had no negotiations with the Pope Manufacturing Company by correspondence or otherwise for a new license during 1886 under patents then owned by it, did you? Please answer this question "yes" or "no," and then explain your reason for such answer if you desire.

A. I do not remember any correspondence for a license on my part, but, as I before stated, there was correspondence on their part,
I think, charging me with infringement and, I think, offering
696 me some agreements for the future. Some of those agreements offered by them were contingent to my making certain other agreements with the Overman Wheel Company. This is my recollection of the correspondence.

C. Q. 71. You say in your direct examination that you were notified "to make all communications on this subject through their attorneys, Messrs. Coburn & Thacher, Chicago." When was that notification?

A. I think some time in December, '86.

C. Q. 72. Wasn't that subject therein referred to—the subject of a license from the Pope Company to you?

A. It was referring to an agreement that we had held a conference about in Boston some two months previous. I never understood it as referring to a license until I called at Mr. Coburn's office, when he showed me a copy of a written agreement which they wished me to enter in with them, and which I declined to do for the reason that they wished to extort money from me without any equivalent.

C. Q. 73. Did you write to the Pope Manufacturing Company before you went abroad in 1886 one or more letters of the nature of negotiations on your part to the effect of your taking another license from it to manufacture bicycles?

(Objected to as incompetent, the letter being the best evidence.)

A. I do not remember doing so, but I do remember replying to several threatening letters received from the Pope Company and saying that I would call and see them when I returned from Europe.

C. Q. 74. Did you not in the fall of 1886 send to the Pope Manufacturing Company a letter with a draft of a license contract such as you were willing to sign?

697 A. I sent the Pope Manufacturing Company a letter containing a draft of an agreement that I was willing to enter into with them at that time to avoid litigation.

C. Q. 75. Were you, by the terms of that agreement that you submitted, to pay royalties under patents then owned by the Pope Manufacturing Company?

A. I think there was a stipulation to pay a certain amount of money which was understood to apply to a fund, or, as Colonel Pope referred to at the conference, to "chip in" to support the business.

C. Q. 76. I asked you about the terms of the contract. Was it in the form of royalties and at a specified amount per machine made?

(Objected to by defendants' counsel for the reason that if complainants have any such alleged paper it is the best evidence and the evidence which the witness is entitled to examine while being interrogated thereon.)

A. It might be so construed without knowledge of previous verbal agreements and conversations.

C. Q. 77. The Pope Company declined to sign that license agreement submitted to it by you, drew another one as their ultimatum of the terms and conditions of a new license agreement, sent it to Coburn & Thacher, and notified you of the fact, and that you could make all communications on this subject thereafter through its attorneys, Messrs. Coburn & Thacher, Chicago, did it?

A. Yes; they did not send the agreement that I sent them, and did send an agreement through Messrs. Coburn & Thacher, which I refused to sign.

C. Q. 78. Did you notify the Pope Company that after the 1st of January your business would be conducted by the Gormully and Jeffery Manufacturing Company; if so, when and how?

698 A. I notified them through Messrs. Coburn & Thacher that the business of Gormully & Jeffery had been sold to the Gormully and Jeffery Manufacturing Company about that time. The letter itself will show the exact words and date.

C. Q. 79. Can you give about its date?

A. I think it was the 4th day of January, '87.

C. Q. 80. You are the president and one of the directors of the Gormully and Jeffery Manufacturing Company and personally conduct its business, do you?

A. I am the president and one of the directors of said company and fulfill the duties of my office.

C. Q. 81. Do you personally conduct its business?

A. I conduct that portion of the business that my duties as president requires me to do.

C. Q. 82. When did you discontinue the metal-cornice business?

A. I think it was in the spring of '84.

C. Q. 83. Have you had any other business beside that conducted by the firm of Gormully & Jeffery and Gormully and Jeffery Manufacturing Company since that time?

A. No.

C. Q. 84. Do you devote your time to the interests of the Gormully and Jeffery Manufacturing Company and have personal charge of any part of its business more than any other part; and, if so, what is it?

A. I devote my time to the interests of the Gormully and Jeffery Manufacturing Company and have charge personally of the office work of the firm.

C. Q. 85. Who has charge of the factory?

A. Mr. Thomas B. Jeffery, the secretary of the company, has charge of the manufacturing department.

699 C. Q. 86. Is his entire time devoted to that?

A. It is.

C. Q. 87. How much of the capital stock of the Gormully and Jeffery Manufacturing Company do you own?

A. Over nine hundred shares.

C. Q. 88. And the entire capital consists of two thousand shares of a hundred dollars each, does it?

A. It does.

C. Q. 89. What were the assets of the firm of Gormully & Jeffery inventoried at on the 1st of January, 1887?

A. I don't remember exactly. To the best of my recollection the machinery, tools, stock on hand manufactured and unmanufactured at cost over one hundred thousand dollars, exclusive of the good will, etc.

C. Q. 90. And the good will was estimated at how much?

A. I haven't the exact figures with me, but the good will and certain patents the company were interested in made up the balance of two hundred thousand dollars.

C. Q. 91. Had all of this two hundred thousand dollars been made in the business of manufacturing bicycles and velocipedes, growing out of the business in which you first invested two thousand dollars?

A. No, sir.

C. Q. 92. How much had Mr. Jeffery put into the firm during that time besides his time and the five thousand dollars' worth of machinery that you have testified about over and above what he had drawn out of the firm?

A. I can't say from memory.

C. Q. 93. About how much?

A. I cannot tell from memory without reference to books.

700 C. Q. 94. How much did you put in over and above what you had drawn out besides the two thousand dollars you have testified about?

A. I cannot answer that from memory.

C. Q. 95. If Mr. Jeffery had put in any considerable sum thereafter, not as a loan but as a direct increase of the assets of the firm, wouldn't you as an equal partner have contributed a like amount to the firm and be likely to have remembered?

A. At the time of the partnership I had invested considerable money in the business and was furnishing the extra capital then needed, but what the amount was I don't remember, nor do I re-

member the amount of Mr. Jeffery's full contributions at different times.

C. Q. 96. Who principally makes up your catalogues that you use to illustrate what you manufacture and sell?

A. Myself, with the assistance of clerical help I have.

C. Q. 97. Who decides as to the cuts showing the internal parts of any of the machines made by your firm?

A. No particular person; sometimes myself; sometimes an employé who is acquainted with that portion of the business, and sometimes on strict mechanical questions Mr. Jeffery's opinions have been asked. It is considered a portion of the office work—the issuing of the catalogues.

C. Q. 98. Did you or your book-keeper attend to the office work of the bicycle business before you discontinued your other business and devoted your entire time to the manufacture of bicycles?

701 A. The book-keeper attended to the office work at that time under my instruction. I used to go there one, two, or three times a day, as the needs of the case required.

C. Q. 99. When did the firm move its place of business from South Canal street, on the west side, to North Franklin street, on the north side?

A. I think in the spring of '84. I think I went out of the business on Michigan street in February or March, '85, instead of '84, as I previously said.

C. Q. 100. Are these illustrations in the catalogues made from the machines, or does Mr. Jeffery make the machines from the illustrations in the catalogues?

A. The illustrations are made from the machines. When practical the machines are photographed and then engraved.

C. Q. 101. This catalogue which was introduced as an exhibit in your testimony is in the name of Gormully & Jeffery and was issued in September, 1884, and bears that date, does it?

A. Yes. That particular one I presume was issued about September, 1884. I think this was the second edition of the spring catalogue, but am not sure.

C. Q. 102. This catalogue contains on the first inside page, under the heading "Greeting," the following language: "All bicycles are manufactured under a general license from the Pope Manufacturing Company, of Boston, Massachusetts," does it not?

A. It does.

Redirect examination by C. K. OFFIELD, Esq.:

R. D. Q. 1. How long after April 1, 1886, were you in Europe that year?

A. I left some time in July, and returned, I think, early in September.

702 R. D. Q. 2. By what right did you use any machinery of Mr. Jeffery in the manufacture of your goods before he put it into the partnership assets?

A. I leased the use of it at a certain monthly rental.

R. D. Q. 3. How much money or capital did you personally loan

at any one time to the old firm of Gormully & Jeffery to carry on business?

A. I don't remember exactly, but I believe the firm has owed me over twenty thousand dollars at a time, for which they paid me interest, besides the money I had invested in buildings, for which they paid me rental.

R. D. Q. 4. Did Mr. Jeffery ever advance or put in a dollar of money into the firm of Gormully & Jeffery?

A. I think he put in some; how much I can't remember.

R. D. Q. 5. Did he put in any letters patent as a part of his capital?

A. I think yes.

R. D. Q. 6. Did you own the real estate and buildings upon and in which the firm of Gormully & Jeffery carried on their business?

A. I did.

R. D. Q. 7. During your copartnership with Mr. Jeffery was Mr. Jeffery a copartner or to have any interest in the copartnership proceeds until after you settled with the complainant corporation under your personal contracts in evidence here?

A. It was an understood thing when Mr. Jeffery came into copartnership with me that I was to furnish all the necessary capital to run the business, and I told him that I had obligated myself to pay a certain or stipulated royalty on any bicycles that I made or sold or had any interest in making, and that I should make it a
703 part condition between us that I should first pay such royalties before any profits of the concern were declared or divided. He protested, but finally agreed that as I had personally obligated myself I should do so.

R. D. Q. 8. Have you any letter or communication from O. E. Peters, one of the patentees of "Complainant's Exhibit Peters Patent," which shows the consideration received by the patentees for the sale of that patent; and, if so, will you produce it and have it marked "Defendant's Exhibit Consideration Peters Patent"?

(Objected to as irrelevant and immaterial, and is not sufficiently identified.)

A. I have and will.

R. D. Q. 9. Defendants' counsel offers the letter in evidence under the identification set forth in the last question and asks the witness who is the E. R. Drew mentioned in the letter and what is his relation to Albert A. Pope, president of the corporation complainant, and to Charles E. Pratt, its attorney.

A. I believe, at least I have understood, Mr. Drew was employed to paint signs for the Pope Manufacturing Company, of whom A. A. Pope is president and Charles E. Pratt attorney.

Recross-examination by L. L. COBURN, Esq.:

R. C. Q. 1. Do you know O. E. Peters' signature?

A. No further than seeing it on letters signed by him, coming from him.

R. C. Q. 2. How many such letters did you ever see?

A. I think two or three.

R. C. Q. 3. You never saw him write any of them, did you?

704 A. No, sir.

R. C. Q. 4. Who was your attorney or adviser in patent matters in 1883 and 1884?

A. I had none.

R. C. Q. 5. You stated that you came home, after going to Boston, to consider the matters there talked about. With whom did you advise about such matters?

A. I had advised with a common law attorney some, but took very little advice from any one, relying more upon my own judgment.

R. C. Q. 6. Who was that attorney, and with whom besides, if any one, did you talk with about it?

A. I am not sure of the attorney's name. I think it was a man named Harkweather. I think I talked some with Mr. Jeffery about it, but he strongly advised me to keep away, and would have little to say on the subject. To the best of my recollection I had very little talk with any one, almost entirely relying on myself.

R. PHILIP GORMULLY.

Subscribed and sworn to this 1st day of September, A. D. 1887, before me—

FREDERICK C. GOODWIN,
Notary Public.

Adjourned to Friday, September 2, 1887, at 10 o'clock a. m.

705 FRIDAY, *September* 2, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

And thereupon defendants' counsel now calls as a witness in their behalf D. J. POWERS, who, being by me duly sworn to state the truth, the whole truth, and nothing but the truth, deposes as follows in answer to interrogatories propounded to him by C. K. OFFIELD, Esq.:

Q. 1. Please state your name, age, residence, and occupation.

A. D. J. Powers; seventy years; Chicago; mechanical engineer and manufacturer.

Q. 2. Please state somewhat fully what knowledge or experience you have had, either practical or theoretical, which qualifies you to compare different mechanisms and by such comparison point out and identify their respective similarities or differences, and generally what use you have made of this knowledge or experience in investigating patented devices or familiarizing yourself with letters patent, either as an expert witness in the Federal courts or otherwise.

A. I have been engaged for more than fifty years in the study and practice of mechanics, and during that period have had a wide range of experience in various lines of manufacture, and have usually had the charge, as master mechanic or foreman, of what-

ever business I was engaged in, either for myself or for others, and during my entire mechanical experience I have had occasion to devise and construct many different machines and contrivances for various purposes. I am always inclined, when I see a mech-
706 anism containing any novelty, to examine and comprehend the same, whether in my own line of business or any other. I have invented and applied for somewhere from forty to fifty patents in this country and in foreign countries upon my own devices. I have also had occasion to examine and compare great numbers of devices and mechanisms for other parties, and have often had occasion to study patents and drawings to determine the scope of inventions set forth in them. I have also often been sworn as a mechanical expert witness in patent cases being litigated in the United States court.

Q. 3. Please state whether or not you have personally and practically had any experience in relation to anti-friction devices in connection with bearing surfaces of any description; and, if so, what.

A. I have made some inventions in the way of anti-friction furniture castors and patented the same, and during the pendency of the case before the Patent Office had occasion to study the prior art very thoroughly in which anti-friction rollers, balls, and disks were employed, and during such study I became very well posted in the nature and operation of those various anti-friction devices.

Q. 4. Please state whether or not you have examined, so as to thoroughly familiarize yourself with the same, "Complainant's Exhibit Peters Patent," especially as to the devices identified by the second claim of that patent and the mechanisms represented by figure 4 of the patent.

A. I have examined such patent exhibit and believe that I fully understand the same as summed up in the second claim and shown in figure 4 of the drawing.

Q. 5. Have you examined carefully, in connection with
707 this Peters patent and to the extent that you fully understand the same and the construction and mechanism therein described, the following letters patent offered in evidence by the defendant:

Defendant's Exhibit Alcott 1870 Bearing Patent,
Defendant's Exhibit Smith 1875 Bearing Patent,
Defendant's Exhibit Smith 1869 Bearing Patent,
Defendant's Exhibit Reese 1872 Bearing Patent,
Defendant's Exhibit Vernon 1872 Bearing Patent,
Defendant's Exhibit Blanchard 1861 Bearing Patent,
Defendant's Exhibit Gardner 1871 Bearing Patent, January 24,
Defendant's Exhibit Gardner 1871 Bearing Patent, April,
Defendant's Exhibit Bailly, Durand, and Others 1866 Bearing Patent,
Defendant's Exhibit Jewett 1868 Bearing Patent,
Defendant's Exhibit Perley 1863 Bearing Patent,
Defendant's Exhibit White 1867 Bearing Patent,
Defendant's Exhibit Barnett and Others 1868 Bearing Patent,

Defendant's Exhibit Sheldon 1872 Bearing Patent,
Defendant's Exhibit Smith 1877 Bearing Patent,
Defendant's Exhibit Chinnock's 1853 Bearing Patent—

(Objected to because defendants are stopped from denying the validity of the Peters patent; that the devices made by them infringe said patent, and also for reasons heretofore given in this case.)

Defendant's Exhibit Webster 1861 Bearing Patent?

A. I have examined, in connection with the Peters patent, the construction and mechanism described and shown in the letters patent referred to in the question, and believe that I fully understand the same.

708 Q. 6. Have you read, so that you understand the same, the deposition given by Mr. John E. Earle, the complainant's expert in this case, especially that portion of it where he attempts to define the second claim of this Peters patent, its scope and effect?

A. I have read such deposition and fully understand the same so far as relates to the second claim of Peters' patent.

Q. 7. Please state what, in your opinion, is the invention of the second claim of this Peters patent, and state whether or not you find the invention identified by the second claim of that patent in any of the defendants' exhibits with which you have just testified you were familiar, and whatever you may state or define to be the claimed invention of Peters in his second claim please, in your answer in comparing this claim with the state of the art, interpret it in two ways—first, without the roller bearings, as this claim was treated by complainant's expert; second, interpolating the rollers into the claim as an element thereof—and assuming for the purposes of this question that spherical balls may be substituted for the rollers in this claim.

(Objected to for reasons given above.)

A. I understand the invention of the second claim of the Peters patent, irrespective of the anti-friction rollers, to consist in the bearing or axis with a beveled shoulder at its inner end combined with a nut corresponding with a bevel at its opposite end. That is the substance of the second claim, as I understand it; and under another phase of the question I will consider that it is designed for anti-friction rollers, and for the time being will admit that such rollers may be considered the equivalent of anti-friction spheres or balls, and with this double interpretation of the claim I will

709 proceed to examine the prior art in the case pertaining to anti-friction bearings.

And first in order I will refer to the patent of Allcott of 1870, and in said patent I find shown and described identically such a bearing with an inner beveled shoulder and an outer beveled nut facing each other of the same character and in the same relation and for the same purpose as are the several features of the device summed up in the second claim of the Peters patent. This Allcott

bearing with its beveled faces is adapted for securing anti-friction rollers substantially identical in character with those of Peters as set forth in this specification and shown in Fig. 4 of the drawing and summed up in this second claim.

I am unable to discover any material difference between Allcott and Peters device, so far as the same is embodied in the said second claim of Peters. Therefore, in my judgment, the Allcott bearing device is a full and complete anticipation of the Peters device of the second claim, whether considered without the anti-friction rollers of Peters or with them. In expressing this opinion I have in mind some differences in the formation of the ends of the Peters rollers as compared with those of Allcott, but do not discover that those differences are in any way material, so far as the said second claim of Peters is concerned, the rollers in both devices having identically the same beveled ends, and are held in position longitudinally by identically similar beveled shoulders upon the bearing and nut. Therefore, as I at present understand the matter, I repeat that I consider Allcott to completely and fully anticipate Peters, either with or without rollers, in every essential respect as summed up in the second claim of Peters.

710 Referring to the Exhibit

SMITH PATENT, 1875,

I find it to show a bearing or axle having a beveled shoulder at its inner end and a nut at its outer end with an inward bevel, said bevels facing each other. Said patent also shows a box adapted to be journaled upon the said bearing, said box being inwardly beveled at its two ends, corresponding to the bevels at the shoulder and not at the bearing. Thus this Smith patent shows substantially such a bearing with beveled shoulders and beveled nut as is summed up in the second claim of the Peters patent, and the said second claim of Peters in its language would fully — as properly applied to and describe the Smith device as it does the device shown in figure 4 of Peters' drawing. Therefore, for any reason that I can discover, the Peters bearing, regarded merely as a bearing, is fully and completely met in its construction and character by the bearing device of the said Smith patent exhibit.

Referring to the exhibit

REESE PATENT, 1872,

I find it to show a bearing identically such as is described in the second claim of Peters, it being a bearing having a beveled shoulder at one end and a beveled-faced screw-nut at the other, thus rendering it capable of being shortened up or adjusted substantially the same as is contemplated in the Peters device, and the only difference between this and Peters' is that the beveled shoulder of the bearing is at its outer instead of its inner end; otherwise it is identical with the bearing and nut enumerated in the second claim of Peters'. It would therefore appear to me to be a substantial antici-

pation of Peters' invention summed up in the same said second claim.

711 Referring to the

VERNON PATENT, 1872,

I find it to show another bearing substantially identical with that of Peters', it having a beveled shoulder at its inner end and a beveled sleeve at its outer end, actuated forward and back by a screw-nut. Thus there is no difference between this device and Peters' other than placing the bevel upon an inside wash or sleeve instead of directly upon the inner side of the nut. This difference would seem to constitute no material patentable difference, but a mere mechanical change, it being obvious that the beveled shoulder could be formed upon the nut as readily as upon the sleeve inside of it, in the judgment of a mechanic skilled in the art to which the device relates. This Vernon device is, therefore, another anticipation substantially of the Peters device as summed up in the second claim.

Recess.

Referring to other of the patent exhibits, I find various instances in which beveled and angular surfaces are employed to secure and facilitate the operation of anti-friction balls, among which may be noticed the

GARDNER PATENT, 1871, APRIL,

in which, in the drawings, are shown beveled shoulders, double bearings, against which impinge the anti-friction balls, and also anti-friction rollers, which goes to show that such constructions were adapted to anti-friction purposes at a much earlier date than Peters' patent. The

GARDNER PATENT, JANUARY, 1871,

also shows beveled surfaces against which anti-friction balls are adapted to move. This fact will be noticed in figures 2, 4, and 5 of the drawing. In

712 CHINNOCK'S (ENGLISH) PATENT, 1853,

a device is shown adapted to operate anti-friction balls in circular recesses and with a screw-nut device, by which those recesses could be enlarged or diminished, the circular recess not being materially different from the angular recesses, but operating in substantially the same manner. Thus it will be seen that at the date of Peters' patent the securing of anti-friction balls and rollers in angular and circular grooves in various ways and in various modifications was an old and well-known expedient, and tends to limit or anticipate entirely the invention of Peters as summed up in his second claim.

Referring to the remaining patent exhibits included in the question, I find them to show and describe various adaptations of anti-friction rollers and anti-friction spheres and balls. The

PATENT DRAWING OF BLANCHARD, 1861,

shows the application of anti-friction rollers to a bearing in substantially the same manner as Peters shows them in Fig. 4 of his drawing, except that the rollers are not beveled at the ends, neither is the bearing or box beveled, but the rollers in Blanchard's rest directly upon the bearing and upon the box in substantially the same mannner as do the rollers of Peters, and for any reason that I can discover would operate just as well in every respect in practical use as the device shown in Fig. 4 of Peters'. In fact, this Blanchard device is substantially the same as Peters' device is shown in Fig. 2 of his drawing.

Peters states in his specification that the object of his beveled device is for the purpose of keeping his rollers in place under certain circumstances, and that is all the function that I find stated to be derived from beveling the ends of his rollers and making
713 corresponding beveled shoulders upon his bearing and nut.

This is clearly a subordinate purpose and cuts no material figure so far as the anti-friction action of the rollers is concerned; consequently the rollers of Blanchard are adapted to operate equally well in all respects upon the bearing as the rollers of Peters' shown in figure 2 of his drawing or even in figure 4.

Referring to

BAILLY, DURAND, *et al.* PATENT, 1866,

I find anti-friction balls applied in various ways in circular grooves so as to abate friction upon bearings, and with an increased diameter upon the bearing between the balls which operate substantially to keep the balls in place, as do the beveled shoulders in Peters'. In effect this enlargement of the bearing as shown in figures 6 and 7 operates to retain the wheel or hub in position, substantially the same as do the beveled shoulders of Peters', and caps as secured by screws equivalent to Peters' screw-nut, which operate to keep the balls in their working position. Thus this patent further shows another of the variety of ways for employing anti-friction balls for the same purpose, to wit, to abate friction and retain the parts in proper working position.

Referring to the

JEWETT PATENT, 1868,

we find segments of circles formed annularly around the bearing in which anti-friction balls are secured by an enclosing box, the balls being in circular grooves instead of those of a diagonal shape. Thus this patent shows another of the numerous modifications of the parts in which the same elements are combined to effect the purpose, and only varying in their form and mode of adaptation.

714 Referring to the drawing

WEBSTER PATENT, 1861,

shows still another application of anti-friction balls to a bearing having an annular circular groove in which the balls are placed and secured by an outward inclosing case having a corresponding interior annular groove, said outside case being divided longitudinally into two parts and secured upon the bearing by screw-bolts or equivalentdevices. Thus this Webster patented device resembles the Jewett last referred to in some of its material respects, but still shows another modification for the same purpose.

Referring to the

PERLEY PATENT, 1863,

shows various applications of anti-friction balls upon bearings for the purpose of diminishing friction, the balls being adapted in concentric grooves upon the bearing and secured in working position by several modifications of enclosing boxes so adapted as to cause the rollers to act for the purpose of abating friction. Thus this patent shows still another modification for the same purpose as those that went before it.

Referring to the patents of

WHITE, 1867, AND SHELDON, 1862,

they show and describe furniture casters in which anti-friction balls are interposed between the upper and lower plates in annular circular receptacles for the purpose of abating friction in the turning of the caster upon the floor. These devices further show the varieties of ways in which anti-friction balls are adapted and applied for the purpose of abating friction in casters and kindred devices.

715 Thus in all the foregoing exhibits of the prior art we find continued and various changes of parts and combinations for the purpose of abating friction, some of them clearly and fully showing and anticipating in every essential respect the Peters device, as summed up in his second claim, and numbers of others in which beveled shoulders and their equivalents are found approximating more or less towards the Peters device, and in all of the ball and roller casters to which I have referred will be noticed that the receptacles for the balls or rollers are adapted with circles or bevels to retain the balls or rollers in their proper working positions and relations; and in view of the foregoing state of the art it would appear that Peters, at the date of his patent, if he invented anything—in other words, devised anything that was new—it was at best upon a very limited scale.

Q. 7. Please compare "Complainant's Exhibit Defendant's American Champion Bicycle" and "Complainant's Exhibit Defendant's American Light Champion Bicycle," both as to the bearings of the master and rear wheel and pedals, with "Complainant's Exhibit Peters Patent" and the second claim thereof, and state whether or not you find the alleged invention or combination of devices identified by that second claim are found or con-

tained in the bearings or bearing parts of either of defendants' bicycles, and give your reasons fully for your opinion.

A. On examining the several portions of defendants' two said bicycles, so far as the anti-friction devices are concerned, I fail to find in either of them, either identically or substantially, the invention of Peters as summed up in his second claim.

716 First. For the reason that Peters' bearing with the beveled shoulders at its inner end and outer nut is obviously adapted for the long friction rollers that are adapted to be used with the device of the second claim, and it is equally obvious that those rollers are adapted to have their bearing support upon the main bearing throughout their longitudinal length, as shown in figure 6 of this drawing, and that there is little or no bearing of any practical account upon the beveled ends of these rollers, Peters stating in his specification that these end bevels upon the rollers and corresponding bevels of the bearing and nut are for the purpose of keeping the rollers in place; therefore it is obvious that he did not consider that they sustained the weight of the vehicle in the way they were used or any material part of it, but that they simply served to keep the rollers in place.

This language is found in substance near the last end of the fourth paragraph from the bottom of the left-hand column of the specifications, on the first page.

I am aware that I differ in my views as stated upon this subject with the learned expert who testified for the complainants in this cause, but nevertheless I am entirely confident that I am right in understanding that Peters' rollers were adapted to take their bearing upon their cylindrical portions upon the main bearing or axle of the vehicle and not upon the beveled ends of the rollers.

The specification, as I understand it, fully supports my view of the case and gives no warrant whatever, in language or other ways, for the position taken by complainant's expert, to the effect that the bearing of the rollers was upon their beveled ends mainly, if not exclusively. Thus from this proper understanding of the Peters patent and on a comparison of the devices employed by defend-

717 ants I fail to find any provision in their anti-friction devices for the employment of rollers of any length or character of a cylindrical form, but instead thereof they employ spherical balls, a series of them at each end of their bearing, that are adapted to rotate in annular grooves of a circular form in their pedal and rear wheel devices, and in angular grooves in the main wheel anti-friction devices. Thus defendants' machines having the circular annular grooves in the mounting of their rear wheel and pedals, in which two sets of balls are adapted to entirely fill the grooves and to operate as anti-friction devices, do not contain the roller device of the Peters patent as summed up in the second claim, but devices of an entirely different construction and substantially different in their operation.

It is entirely obvious that Peters' device of the second claim could not be substituted in any part of it or any measurably correspond-

ing part, for the fact that they are radically different in character as well as in mechanism.

Referring to the anti-friction devices of defendants' main wheel, I find them to be different in character from the devices for a similar purpose as summed up in the Peters claim in the fact that defendants' bearing has no nut with a beveled shoulder, either such or substantially such as shown, described, and claimed in the second claim of Peters, but instead of such a nut it has a plain-faced nut, which acts against a sleeve, which moves longitudinally upon a feather and having a beveled front that corresponds with the bevel upon the bearing, and thus forms an annular beveled groove. This collar is adapted to be pressed forward by the plain-faced nut behind it, which is fitted to a screw-thread upon the bearing shaft. Thus, while defendants' device has parts that form an annular groove, it is not formed by a nut having a beveled shoulder,
718 as in the patent of Peters, and in the second claim I understand that Peters' patent, in consideration of the state of the art, is not entitled to any considerable breadth of construction, but calls for a nut with its bevel edge or something substantially like it.

Thus, for the foregoing reasons and others that might be added, I do not find, as at present understood, in either of defendants' bicycles such anti-friction devices or substantially such as are employed by Peters and enumerated in the second claim of his patent.

In making this final statement of course I take into consideration the anti-friction devices of the prior art to which I have already referred and in which are shown and described divers and sundry anti-friction ball devices much more nearly resembling devices employed by defendant than does the defendants' devices resemble the anti-friction devices of Peters summed up in his second claim.

If desired I will point out in the direct or cross the patents that I refer to as more nearly resembling defendants' devices than does the defendants' device of Peters'.

Q. 8. Assuming that the sole bearing contact in the Peters patent was on the bevel contact of the ends of the rolls and there was no bearing contact between the body of the roll and the axle, would such a device, in your opinion, be practical and operative in the absence of the cage of the Peters patent; and, if not, why not?

A. No; I should not consider that it would be a practicable or useful device without the cage, in part, for the reason that there would not be a full complement of rollers for a free roller action; and, secondly, the beveled ends of the rollers resting and bearing upon the beveled shoulders, upon which they are shown to
719 be in contact, would necessarily have a considerable rubbing or sliding action for the reason that the smallest part of the rollers moves upon the largest part of the beveled shoulders and *visa versa*. Parts to move without material friction between them must have their contacting parts alike in such a case, and must have their acting ends of their rollers straight or parallel with their length, and the ledges upon which they run must have corresponding surfaces, substantially as shown, so far as the rollers are concerned, in second, fifth, and eighth figures of Peters'. Such rollers would

roll upon corresponding surfaces without slipping, but the rollers of Fig. 4, as I have stated, must necessarily rub extensively when supported and rolling upon the tapered ends.

For the foregoing reasons I should consider a bearing as shown in Fig. 4 of Peters' and resting wholly upon the beveled ends of its rollers to be practically useless as an anti-friction device.

Adjourned to Saturday, September 3, 1877, 10 o'clock a. m.

SATURDAY, *September* 3, 1877—10 o'clock a. m.

Met pursuant to adjournment.
Parties present same as before.

Q. 9. As I understand you, then, the rollers of the Peters patent are an essential element in and form part of claim 2?

A. Yes; I so understand it, and have intended to be so understood. They are co-working parts and are practically a part of the bearing. When the claim is read in connection with said specification no other conclusion can be reached.

720 Q. 10. Please look at the model now shown you and which I shall offer in evidence as "Defendant's Exhibit Model Allcott Patent No. 2" and state whether or not you have compared his model carefully with "Defendant's Exhibit Allcott 1870 Bearing Patent," and state whether or not said model is a true and exact model and reproduction of the devices shown and described in the said Allcott patent.

A. Yes; I have examined said model in the Allcott patent, and carefully compared the same with the specification and drawing of said patent, and find it to be an entirely correct model of said device.

(Defendants' counsel here offers in evidence this model and requests that it may be marked and identified with this record as above.)

(Defendants' counsel further stating that this is the model contemplated and referred to in the foregoing deposition of Mr. Jeffery, and here calls attention of the complainants' counsel to this fact, and especially to its being offered in evidence in this connection.)

(Model objected to as not properly representing the patent and as immaterial.)

Q. 11. Have you examined carefully, so that you understand the same, "Complainant's Exhibit Wallace Patent No. 1" and "Complainant's Exhibit Wallace Patent No. 2," especially as to claims 2 and 3 of Wallace patent No. 1 and claims 2 and 3 of Wallace patent No. 2, and do you understand the construction and operations of the mechanisms therein referred to and described?

(Objected to for reasons before given.)

A. I have examined patent Exhibits Nos. 1 and 2, and believe that I fully understand the same, and especially the devices summed up in the claims referred to.

Q. 12. Please compare respectively, so far as you may deem
721 it relevant in the expressing of your opinion in so doing, the various ball-bearing exhibits of defendants heretofore called to your attention and state what, in your opinion, is the invention respectively of the respective two claims of said Wallace patents, and give your reasons for your expressed opinion.

And in addition to the defendants' exhibits already called to your attention I call your attention to the following additional exhibits, which you may use in your answer, first stating if you understand the same and their mechanisms, namely:

Defendant's Exhibit Bate's 1878 Bearing Patent.
Defendant's Exhibit Monks 1880 Bearing Patent.
Defendant's Exhibit Lewis 1879 Bearing Patent.
Defendant's Exhibit Salamon 1880 Bearing Patent.
Defendant's Exhibit Hughes 1880 Bearing Patent.
Defendant's Exhibit Jeffery 1883 Bearing Patent.

(Objected to for reasons before given.)

A. I have examined the additional exhibits to which my attention is now called and fully understand the devices therein shown and described.

Referring to

WALLACE PATENT No. 1,

I find the second claim to sum up in anti-friction bearing for a wheel or axle consisting of a one-part bearing box and a two-part sleeve, having a circular row of balls within said box and between bearing surfaces in the box and on either part of the sleeve, and adapted for adjustment for wear and securement on an axle by a screw-thread on the outer end of one part of the sleeve operating to draw it toward and form the outer part. Such in substance is the first claim of the patent.

722 And, referring to the prior art, I will first call attention to the provisional specifications of

WILLIAM HENRY MONKS OF 1880

(English patent), in which I find and will quote the following description of an anti-friction ball-bearing device adapted for bicycles:

"Third. An improvement in the system of ball bearings.—For the axle carrying the front wheel of the bicycle I employ a turned bush conical at the outer end and a somewhat similar one which is screwed upon the outside of the first said bush. In the V-shaped groove which is formed by these two bushes when in position I arrange a series of balls, which rotate between the bushes and the lower part of the fork, which forms a cap somewhat circular, with a segmental groove in it for the balls to work in (or I may in some instances employ a double row of balls in a double groove and coned piece, as above described)."

The foregoing description, it will be noticed, clearly and fully sets

forth an anti-friction bearing for a bicycle consisting of a two-part sleeve so adjusted as to receive balls in their annular groove, and a one-part bearing with a segmental interior groove for the balls to work in, and a screw device for adjustment against wear and as a securement in position. Thus this device contains all the elements in the same combination and for the same purpose as those enumerated in the second claim of the first Wallace patent, and consequently operate to limit the invention of the said Wallace claim to very narrow dimensions.

Referring to the

723 SALAMON ENGLISH PATENT, 1880,

I find it to show and describe a velocipede bearing having sleeves adopted upon its main bearing shaft, with beveled collars upon them corresponding to beveled circles in the outer bearing, thus forming annular grooves in which is secured a series of anti-friction balls operating substantially similar to the device enumerated in the second claim of Wallace and with screw adjustment to compensate for wear in substantially the same manner, thus tending further to limit the breadth and scope of the second claim of Wallace.

Referring to

ENGLISH PATENT, LEWIS, 1879,

I find shown and described therein an anti-friction bearing for bicycles and velocipedes substantially such as are enumerated in the claim of Wallace, being an anti-friction bearing consisting of a one-part bearing box and a two-part sleeve adapted for a circular row of balls or rollers and with a screw device to adjust one of the sleeves for proper securement or against wear, all substantially the same in its parts and operation as the devices enumerated in the said Wallace claim. This Lewis device further tends to anticipate and limit the breadth of the Wallace invention, as it describes and shows substantially the same device in construction and operation and for identically the same purpose.

Referring to the

ENGLISH PATENT, BATE, 1878,

I find therein shown and described another velocipede device, containing all the parts of a bearing two-part sleeve adapted for and having a row of anti-friction ball devices therein and a screw
724 device for adjusting the same and compensating for wear, thus further operating to anticipate and limit the invention of the second claim of Wallace.

Referring to the American patent,

SMITH, 1877,

I find it to show and describe an anti-friction device having an undivided sleeve and a divided or two-part bearing box, the sleeve

and bearing box being so adapted as to form a circular groove, in which are secured a circular row of balls in a proper manner to decrease friction and with screw devices with which the parts can be adjusted to each other and to compensate for wear, thus substantially containing the elements and combination of the said second claim of Wallace No. 1.

Thus in all of the foregoing English and American patent exhibits I find either substantially or identically the invention contained in the second claim of the first Wallace patent.

Referring to the third claim of the Wallace patent, which is the same in substance as the second claim, with the added descriptive device for the adjustment of the sleeve, which is screw-threaded upon its exterior and adapted to operate in an internal thread in a boss secured to the axle, I find in the several exhibits to which I have referred several instances in which one of the sleeves is adapted to be adjusted by a screw secured in a thread upon the axle in substantially the same manner as that enumerated in the third claim of Wallace. Such will be seen to be the fact in the patent of Lewis, already referred to, in which case a screw, D, passes through the boss at the axle and acts upon the sleeve direct instead of a thread upon the outside of the sleeve screwing into a thread
725 in the boss upon the bearing. Thus the two devices differ in mechanical construction, but operate substantially the same in use and effect, and therefore I regard them as substantially alike in character, and thus embodying and containing the same invention in the third said claim of Wallace No. 1. A substantially similar screw adjustment is also shown in figure 18 of the Bate patent, and thus further anticipates the invention embodied in the third claim of Wallace.

Referring to the

SMITH PATENT, 1877,

it also shows a screw adjustment secured in a boss for the same purpose of adjustment, apparently. Thus in the foregoing patent exhibits I find substantially the invention enumerated in the said third claim of Wallace No. 1; all of which tends to anticipate or limit the breadth and scope of the invention thereof.

Referring to

WALLACE PATENT NO. 2

and to the second claim thereof, I find it to read as follows: "Constructed and combined substantially as herein set forth, a two-part sleeve, a bearing box, a row of balls, a serrated annulus, and a locking button, with an axle and hub and flange, essentially as shown and described."

In anticipation of this claim, I will refer to Monks' provisional specification, English patent, from which I copied the description of an axle having a divided sleeve with conical faces adapted for a row of circular anti-friction balls, and a one-part box or cap with an interior segmentary groove for said balls, and an adjusting screw

device to compensate for wear, etc. In this same specification is further recited the following:

726 "The outer end of the bush is formed into a milled or ratchet head, and is prevented from turning round after adjustment by means of a pawl fastened to a plate, my object being adjustment in a simple and efficacious manner, when required."

Thus in this specification we find fully and completely described all of the elements and combinations of the second claim of Wallace No. 2, including the serrated annulus and locking button complete. In my judgment, this English device fully and completely anticipates this second claim of Wallace No. 2, it being the same thing in all respects, apparently for the same purpose, and operating either identically or substantially identical in all respects.

Referring to the third claim of Wallace No. 2, I find it to be the combination, in a ball-bearing device, of a free bearing box, G, and a shell case, E, substantially set forth.

Referring to the

PATENT, JEFFERY, APRIL 17, 1883,

I find shown and described a ball-bearing device, substantially like the one shown and described by Wallace, in combination with a free bearing box and a shell case substantially the same as that of Wallace, it being adapted for adjustment and having all the material functions and parts set forth in the specification of Wallace No. 2 and summed up in his third claim.

Therefore, in the prior art as at present understood, I find all the elements and combination of Wallace No. 2, as summed up in the second and third claims thereof, either identically or substantially anticipated.

Q. 13. Have you examined "Defendant's Exhibit Model
727 Figure 20, Bate Patent," and "Defendant's Exhibit Model Figure 20*a*, Bate Patent," and "Defendant's Exhibit Figure 3, Lewis 1879 Bearing Patent," so that you understand the same, their construction and operation?

A. I have examined said exhibits and believe that I fully understand them.

Q. 14. Have you compared these exhibits respectively with the patents or figures of patents which they profess to represent? And, if so, please state whether or not they are accurate models for such patents or figures, so far as they profess to represent such devices.

A. I have examined and compared said models with the patents respectively that they are intended to represent and have found them to be correct representatives, as far as they go, of the corresponding devices of the patent.

Q. 15. Please look at the model now shown you and state what it represents.

A. Having examined the model, I understand it to represent the axis and anti-friction-bearing devices and their several kindred parts of the bicycles of the defendants.

(Defendants' counsel here offers in evidence and requests that the

same may be identified with this record and marked Defendant's Exhibit Defendant's Device.)

Q. 16. You may now state whether or not either of the three models first called to your attention contain and exhibit respectively the claimed inventions of claims 2 and 3 of either of said Wallace patents, giving your reasons therefore, and you may use by way of an illustration in this answer the model of defendant's device
728 last offered in evidence, and also any of the patent exhibits to which you may see fit to refer.

(Question objected to for reasons above given.)

Adjourned to Monday, September 5, 1887, 10 o'clock a. m.

MONDAY, *September* 5, 1887—10 o'clock a. m.

Met pursuant to adjournment.
Present: Same as before.

A. Referring to the three models called to my attention, I have to say that I find the second claim of the first patent of Wallace to be fully and completely met by the Bate model, figure 20, which shows a wheel and axle consisting of a one-part bearing box and a two-part sleeve having a circular row of balls within said box, with bearing surfaces in the box and upon either part of the sleeve and adapted for adjustment for wear and securement in position on an axle by a screw-thread at the outer end of one part of the sleeve, operating to draw it toward and from the other part identically according to the language of the claim, and thus containing the precise invention enumerated in said claim.

Model No. 20*a* also shows precisely the same combination and arrangement of parts, except that the outer sleeve slides back and forth upon the feather and has a nut to actuate it forward and to prevent it from going backward. Thus this model exhibit shows the invention contained in said second claim substantially, but not identically, as in No. 20, for the reasons pointed out.

The

LEWIS MODEL EXHIBIT

also shows substantially the invention of said second claim, for the reason that the outer sleeve is adapted to be adjusted by a
729 screw passing through the crank hub instead of being formed within it, as in the Wallace device—a difference no way material, so far as the operation and effect in use is concerned.

The third claim of the first Wallace patent I understand to be the same combination of parts as the second claim, and with the addition of a specific description of the character and kind of screw adjustment shown and described in the patent, to wit, an external thread on the outer part of the sleeve operating in an internal thread in a boss, secured to the axle on the opposite side, substantially as set forth.

The foregoing quotation shows the precise character of Wallace's screw adjustment, and nothing precisely like it is found in any of the

three model exhibits, but the Lewis model shows an adjustment through the hub, as I have before stated, substantially the same in character, and that precise construction shown by Wallace may be understood as not material in the case, for the reason that it is not shown or contained in either of the several machines of the defendant upon which the suit is brought. Thus the claims of Wallace No. 1 are either identically or substantially met in these model exhibits, said model exhibits being understood to be correct representations of the devices contained in the Bate & Lewis English patents, in relation to which I have previously testified. Referring to

WALLACE PATENT No. 2

and to the second claim thereof, I find in the said model exhibits all of the elements in combination of said claim except the serrated annulus and locking button, neither of which said models contain or show.

Neither do the models show the invention of the third claim of the Wallace patent No. 2.

730 I do not understand that the model exhibits refer to Wallace patent No. 2.

Q. 17. Please compare "Complainant's Exhibit Defendant's American Champion and Light Champion Bicycles" with "Complainant's Exhibit Wallace No. 1 and No. 2," so far as the respective claims of said Wallace patents are concerned, which you have been experting, and state whether or not you find said defendants' bicycles to contain the inventions of either of said claims, and give your reasons therefor, using, if you choose, in connection with your opinion and reasoning, any of the defendants' exhibits offered in evidence in this case.

A. Referring to "Complainant's Exhibit Defendant's Bicycles" and compairing their several devices with the prior art and with the claims of the Wallace patents, I do not find said bicycles to contain the inventions of either of the Wallace patents, for the reason substantially that they show and contain devices differently constructed from those of Wallace and devices more nearly resembling some of those shown in the prior art than those of the Wallace patents.

Referring to the construction shown in defendants' bicycles, I find it to be materially different in detail from the construction of Wallace, in the fact that, while defendants employ sleeves with angular opposite faces adapted for anti-friction balls, their screw adjustment is at the inner end of the inner sleeve instead of at the outer end, as in the Wallace, and, further, that the screw is so adapted that it will only carry the sleeve forward instead of forward and backward, as in Wallace; further, that the sleeve having the screw-thread does not rotate upon its bearing, but is only capable of sliding forward and back when acted upon by its rotating nut. Thus it has

731 no screw-thread upon the outer end part of its sleeve, nor any internal thread secured in the boss upon the axle.

Thus the construction of the parts in defendants' machine differ specifically and entirely from those shown in Wallace as enumer-

ated in his second and third claims of Wallace No. 1; and it is entirely clear that if it is attempted to broaden the claims of Wallace so as to cover defendants' construction as recited or any similar or other construction than that shown in Wallace that it will be met and anticipated in the prior art, as shown in the Bate and Lewis patents and the model exemplification of the same; and when the Wallace patent is narrowed down, as it necessarily must be by this prior art, to its real and specific construction, or substantially so, that defendants' construction fails to contain or embody the thus restricted devices of Wallace, as defendants' construction is substantially different in detail as pointed out from Wallace and much more nearly resembles Bate, with his sleeve upon a feather or with his sleeve and locking nut, than they do the construction shown and described and claimed in the first patent of Wallace.

Referring to the

SECOND WALLACE PATENT,

I do not find defendants' machines to contain the invention in its second and third claims for the reason that both are old in the art, and the further reason that defendants' constructions differ materially from those of complainants; that I have already pointed out, and further than yet pointed out is the fact that defendants' machines do not employ, properly speaking, a serrated annulus nor locking button specifically such as are shown and claimed
732 in second claim of Wallace No. 2, but in lieu thereof a ratchet wheel and pawl adapted to only lock in one direction, whereas the annulus of complainant is adapted to act in both directions.

And, further, that in defendants' machine their bearing box is adapted to and is adjusted rigid in use instead of being free, as in bearing box G of complainants. *In* said bearing boxes of defendants' machines will be found on examination to be rigid, as stated, and in no sense free bearings—that is, bearings that can change their position. The second claim of Wallace No. 2 is completely and fully met in the prior art by the description I have already quoted on the provisional specification of William Henry Monks' English patent; the said quoted description prefigures to all appearance precisely such a device as that enumerated in the second claim of patent No. 2. The third claim of Wallace is met, as already stated, by the bearing box shown in the Jeffery patent, which also shows *in* the construction used in defendants' bicycles, and, as already stated, is not a free box in use, but is clamped rigid when in use; thus it does not contain the invention of the third claim of Wallace No. 2, because it is not a free bearing box like theirs and because, as the defendants use it, it is older in the art than the Wallace patent No. 2.

For the foregoing reasons and others that might be added I do not find in defendants' machines or either of them the devices specifically of either of the Wallace patents or such devices as could be covered by any proper broadening of the claims of said patents

for the reason that the prior art is such that the Wallace patents merely contain no valid inventions, except it may be on such specific differences as are found in such patents and not found in fact or substantially in the prior patents as set forth and exemplified in this testimony.

733 Q. 18. Have you examined carefully, so that you understand the same and the described mechanisms therein, Complainant's Exhibit Shire Patent, especially as to the second claim thereof, and Complainant's Exhibit Veeder Patent, especially as to the first and second claims thereof, and Complainant's Exhibit Kirkpatrick Patent, especially as to the first claim thereof?

A. Yes; I have examined said patent exhibits and fully understand their contents, especially the inventions and devices referred to and the claims enumerated.

Q. 19. Have you examined also, so that you understand the same and the construction and operation of the described mechanisms therein, the following of defendants' exhibits letters patent:

Defendant's Exhibit Bishop 1859 Saddle Patent,
Defendant's Exhibit Nelson 1860 Saddle Patent,
Defendant's Exhibit Schmidt 1871 Saddle Patent,
Defendant's Exhibit Fowler 1881 Saddle Patent,
Defendant's Exhibit Fowler 1880 Saddle Patent,
Defendant's Exhibit Miller 1866 Saddle Patent,
Defendant's Exhibit Harris 1875 Saddle Patent,
Defendant's Exhibit Curry 1867 Saddle Patent,
Defendant's Exhibit Duryea 1884 Saddle Patent,
Defendant's Exhibit Lillibridge 1884 Saddle Patent,
Defendant's Exhibit Lamplugh & Brown 1878 (English Saddle) Patent?

And have you also examined in this connection "Complainant's Exhibit Model Shire Patent," Complainant's Exhibit Model Nelson Patent, and Complainant's Exhibit Model Bishop Patent?

(Question objected to for reasons heretofore given.)

A. I have examined said exhibits and models and believe that I fully understand devices therein shown and contained.

734 Q. 20. Please take up each one of these three complainant's exhibits saddle patents in the order in which they were called to your attention and state respectively and in order what you understand to be the inventions of the respective claims of each identified in the last question, and state whether or not any of the above defendants' exhibits contain exactly or substantially the inventions of said respective claims, and give fully your reasons for any opinion you may express.

Recess.

A. Referring to the Shire patent exhibit and to the second claim thereof, I understand said claim to set forth the saddle of a velocipede connected at its front end with a strap and buckle, which, by lengthening or shortening, operates to raise or lower the seat of the rider to be brought into nearer proximity to the driving wheel, and thus

allowing a wheel of greater diameter to be used than when constructed in the ordinary manner. This I understand to be the subject-matter summed up in the second claim of Shire.

Referring to the Veeder patent and to the first and second claims thereof, I understand the invention of the first claim to consist of a suspended saddle of flexible material and having an under spring of two or more parts, to which the flexible portion is attached at either end, and which metallic parts are extensible, substantially as shown. The second claim is for detailed portions of the device and combines plates B D, clamp F, stop b^2, and adjustible bolt F′, substan-
735 tially as shown. Thus the inventions of the said claims consist in a suspended flexible saddle with especial devices for extending and adjusting the same.

Referring to the

KIRKPATRICK PATENT

and to the first claim thereof, I find it to embody with the backbone of a bicycle or similar vehicle a flexible seat supported by the front and rear springs, which are secured to the said backbone, with the seat suspended directly from said springs at the front and rear.

Adjourned until Tuesday, September 6, 1887, 10 o'clock a. m.

TUESDAY, *September* 6, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Parties present same as before.

A. Referring again to the Shire patent, which has a seat capable of being adjusted up and down and thereby be brought in closer proximity to the driving wheel, I find in the prior art the patent of Harris of 1875 for saddles, a construction that admits of unhooking the front seat of the saddle from spring C and letting it down lower upon another support, and in this respect it works identically the same as does the Shire saddle when let down by lengthening its strap and brings the seat nearer the wheel in the same manner, and only differs from Shire in this respect, from the fact that it provides for only two positions of the seat up and down, while the strap of Shire may admit of more changes; but this is a mere matter of degree in difference and does not change the fact that both the Harris and Shire saddles are capable of being raised and lowered as found desirable, substantially the same as enumerated in the claim of Shire.

736 Referring also to the English patent

LAMPLUGH AND BROWN, 1878,

and to figures 6 and 7 of the drawing, I find in said figures a bicycle seat illustrated and supported in front by an extensible screw device that is adapted to lengthen and shorten the connection and thus to allow the saddle or seat to be raised and lowered substantially the same as the seat of Shire is raised and lowered by manipulating the strap and buckle.

The foregoing patent exhibits, so far as they contain the same devices as Shire or those substantially like his, to that extent *and to* limit and anticipate the invention of Shire.

Referring to the

VEEDER PATENT, 1882,

which claims a suspension saddle, flexible and supported by two or more extensible metallic under springs, I find in the prior art in the Fowler patent of 1880 a suspended flexible saddle, supported upon an under spring in two parts, said metallic parts being extensible, and thus substantially showing the invention of the first claim of Veeder, modified more or less in its parts but adapted to operate substantially the same in use.

Referring to the second claim of Veeder, I find in the art the patent of Nelson for a riding saddle which shows the combination of plates, substantially such as B and D, and an adjusting bolt, F, operating to adjust the parts in somewhat the same manner as the devices enumerated in the second claim of Veeder, of which there is an illustrated model in the case. Thus in the state of the art we find approximate anticipations of the Veeder invention
737 that operate to limit Veeder to the specific invention he shows and describes.

Referring to the

KIRKPATRICK 1885 PATENT

and to the first claim thereof, I find said claim to embody a bicycle saddle supported by independent front and rear springs upon the backbone, the seat being suspended directly from said springs and flexible.

In the prior art the

BISHOP 1859 PATENT

shows a saddle seat, flexible in character, supported upon independent front and rear springs secured directly to the body of the saddle below instead of to the backbone of the bicycle; but I do not discover that it makes any difference, as the seat of the saddle of Bishop is secured to the first object below it, the same as is the seat of the saddle of Kirkpatrick.

True, the form of the springs and the connection of Bishop differ mechanically from those of Kirkpatrick, but not in principle or operation, and come within the language of the Kirkpatrick claim as fully as do the devices of Kirkpatrick; but the difference that I have mentioned, that I do not consider material—of being adapted to a riding saddle instead of to the backbone of the bicycle.

The Bishop saddle is illustrated by a model exhibit, rendering it still more easy to understand the device.

Referring to the prior patent of

MILLER, 1866,

I find it to show and describe the seat of a riding saddle of a

738 flexible character and supported upon independent front and rear springs, which are supported by the main body of the saddle. Thus this Miller saddle device, a flexible seat of a saddle, supported in the manner described by the first claim of Kirkpatrick, and thus containing substantially the invention cited in said claim.

In the prior patent of

DURYEA, 1884,

also shows a flexible seat of a bicycle supported upon front and rear springs attached directly to the backbone of the bicycle, and only fails to come within the language of the claim of Kirkpatrick for the reason that the supporting spring is composed of one piece of metal instead of two pieces, as stated by Kirkpatrick, but this apparently makes no difference for the reason that the single spring could obviously be severed at its middle portion into two springs and operate equally well.

The foregoing prior patents, therefore, all operate and tend to limit the invention of Kirkpatrick as summed up in his first claim to the specific construction he shows and describes.

Thus the prior art to which I have referred clearly operates to narrow down and limit the scope and breadth of the inventions of Shire, Veeder, and Kirkpatrick in the several claims to which my attention has been called and to which I have referred to the specific devices they show and describe or those substantially the same in character.

Q. 21. Please compare "Complainant's Exhibit Defendant's American Champion Bicycle" and "Complainant's Exhibit Defendant's Light Champion Bicycle" and "Complainant's Exhibit Defendant's Ideal Bicycle" and "Complainant's Exhibit Defendant's
739 Ideal Tricycle" with Complainant's Exhibit Shire 1879 Saddle Patent and Complainant's Exhibit Veder 1882 Saddle Patent and Complainant's Exhibit Kirkpatrick 1885 Saddle Patent, particularly as to claims 2 and 3 of Shire, first and second of Veder, and first of Kirkpatrick, and state whether or not you find the inventions of either of said patents or of either of said claims to be found and contained in either of the four bicycle and tricycle mechanisms of defendants, giving your reasons fully for your expressed opinions, and referring to the state of the art, as appears in this record, in such manner as you choose in explanation or affirmation of your opinion.

(Question objected to by complainant's counsel for reasons given above.)

A. Having compared "Complainant's Exhibit Defendant's American Champion Bicycle" and "Complainant's Exhibit Defendant's Light Champion Bicycle" with the devices of claims 2 and 3 of the Shire patent, I do not find said bicycles to contain or embody the inventions of either of the second or third claims of Shire for the reason said bicycles do not have an adjustable seat, corresponding to seat J of Shire, adapted to be raised and lowered by a strap and

buckle, or any equivalent device, but, on the other hand, their seats are adapted to be unchangeably connected to a front and back support and without any capability of being raised or lowered for any purpose.

Further, they do not contain the invention of the third claim because they have no such seat device as spring E and standard D as enumerated in the third claim of Shire, nor any equivalent device.

Neither does "Complainant's Exhibit Defendant's Ideal Bicycle or Ideal Tricycle" contain or show such a seat as is
740 claimed in Shire, in either the second or third claims, the seats of said machines having no strap and buckle or other equivalent means for raising or lowering them nor any spring E or standard D, as enumerated in the third claim of Shire, nor any construction substantially the same; and, inasmuch as the Shire patent is limited by its own language and the prior art to the construction shown and described or one substantially like it, I therefore fail to find in said bicycles and tricycle any possible warrant for the idea that either of them embody the inventions of Shire, as summed up in either the second or third claims of his patent.

Comparing said defendants' bicycles and tricycles, I do not find in the American Champion or the Light American Champion—I do not find in the devises for supporting the saddles in such machines any devices corresponding with the under springs B and D, enumerated in the first claim of this patent, nor do I find in said machines plates B D, clamp F, stop b^2, and adjustable bolt F′, as enumerated in Veeder, nor any devices substantially corresponding to them, when Veeder's invention is limited, as I have previously stated, by the prior art. In assuming that the Champion and Light Champion bicycles do not contain the invention of the first claim of Veeder, notwithstanding their back saddle support is extensible, I am supported in that view by the prior patent of Fowler, which shows a tricycle seat supported by an under spring of two parts and extensible upon the backbone of the bicycle, thus furnishing practically the same advantage and function derived from the extensible feature of the said first claim of Veeder. "Complainant's Exhibit Defendant's Ideal Bicycle and Tricycle" have not such devices to support their seats as enumerated in the first claim
741 of Veeder nor such as enumerated in the second claim for the reason that while the seat constructions of those machines contain extensible devices by means of plates and straining screw still those devices have no clamp corresponding to F′ of the second claim of Veeder nor anything substantially like clamp F′ nor any stop corresponding with b^2, as is enumerated in the claim of Veeder; and said seat devices, not having said clamping and stop element in their construction, therefore fail to contain the invention summed up in said second claim.

Comparing the American and Light Champion bicycles with the Kirkpatrick patent and with the devices first claimed thereof, for the reason that said bicycles show a substantially different construction from that contained in the Kirkpatrick, for the further fact

that the prior art shows several seat devices for bicycles and saddles, as I have already pointed out, in which flexible seats are shown as being suspended directly from independent front and rear springs secured to the backbone of the bicycle or the main part of the saddle in substantially the same manner as is enumerated in said claim, among which the Bishop patent shows such to be the fact, and the devices illustrated by a model in this case, defendants' Ideal bicycle and tricycle clearly do not contain the invention of Kirkpatrick as enumerated in said first claim, as the seat constructions of those machines are materially different from those shown by Kirkpatrick.

Recess.

Q. 22. Please examine carefully "Complainant's Exhibit Latta Patent, 1855," particularly as to the second and third claims thereof, and state whether or not you understand the same and the
742 described mechanisms therein; and you may also in this connection compare said patent with the three defendants' bicycle structures and the single tricycle structure offered in evidence in this case and state whether or not you find the inventions, combinations, or devices in said claims of the *latter* patent or either of them to be contained in either or any of the defendants' bicycle or tricycle structures, and give your reasons fully for your opinion; and you may in this connection refer to any of the exhibits offered in evidence by the defendants relating to this same subject-matter, stating if you understand the same, and consider such exhibits in connection with your expressed opinion in such manner as you may see*m* fit.

A. I have examined the Latta patent referred to and fully understand the same, so far as claims 2 and 3 and their devices are concerned; and on comparing the devices of said claims with the corresponding parts of defendants' bicycle and tricyle structures I do not find in said machines, in combination with their pedal frames, a pedal bar provided with a central longitudinal groove of such a character as that shown in Fig. 4 of Latta's drawing or any single continuous central groove such as are shown in the several drawings of Latta, but instead thereof the pedal bars in all of defendants' machines are practically square bars of rubber in cross-section with several grooves running longitudinally upon their faces and with cross-bars within the grooves of the bars upon the Champion and Light Champion machines; and inasmuch as the second claim of Latta is specific for a pedal bar provided with one central longitudinal groove and defendants' pedal bars having two longitudinal grooves and not only outside but central bearing surfaces for the foot,
743 therefore defendants' pedal bars are not such as embody or contain the invention of the second claim of Latta, especially when the prior art is applied to Latta and he is thus narrowed down to his specific construction.

Referring to the prior art,

SETTLE'S (ENGLISH) 1881 PATENT,

figure 4, shows a pedal bar having longitudinal depressions its entire length.

JACKSON'S (ENGLISH) 1876 PATENT

also shows pedal bars with raised outward edges and a low center practically the same so far as giving a foot bearing at the two outsides as Latta's.

HARRISON'S (ENGLISH) 1877 PATENT

shows circular corrugated pedals. This prior art, showing various forms of patents, as before stated, leaves no great latitude for Latta above what he shows is new, if anything, in his figures, so far as the second claim of his patent is concerned. Latta's third claim is for the combination of the same devices as the second in combination with pivot rod I, upon which they are supported. Defendants' bicycles do not contain the invention of this claim 3 for the same reason that they did not contain the invention of claim 2 and for the additional reason that Latta's pedal bars are pivoted upon the pin I, which, of course, leaves them free to turn upon their pivots, while in defendants' machines the pedal bars are secured rigidly upon their central rod and between their plates, and are not adapted to turn pivotally upon their central rods at all.

744 Therefore I do not find the inventions of the second and third claims of Latta in Complainant's Exhibit Defendant's Bicycle or Tricycle, their pedal bars being different in conformation and shape from those shown and claimed by Latta and being rigid upon their axis, instead of being pivoted, as is specified and claimed in Latta.

Q. 23. Please examine carefully "Complainant's Exhibit Benham 1885 Patent," particularly as to the third claim thereof, and state whether or not you understand the same and the described mechanisms therein; and you may also in this connection compare said patent with the three defendants' bicycle structures offered in evidence in this case as to such claims, and state whether or not you find the inventions, combinations, or devices in said claims of said Benham patent or either of them to be contained in either or any of the defendants' bicycle structures, and give your reasons fully for your opinions; and you may in this connection refer to any of the exhibits offered in evidence by the defendants relating to this same subject-matter and stating if you understand the same, and consider such exhibits in connection with your expressed opinion in such manner as you may see fit.

A. I have examined and do understand the Benham patent exhibit and the devices thereof that are embodied in the third claim and find them to relate to the manner of securing the handle bar; and the said third claim is for a combination with the handle bar what they term detent D in the patent. This detent is an enlargement or collar constructed rigidly upon the handle bar and cen-

trally as to its two ends, and is adapted to enter into a recess in the head of a bicycle and to be secured in that position by screw-threads upon the handle of the bicycle and screw-nuts that encircle a portion of the head in which the handle bar is placed and thus
745 retaining it in position, the detent preventing it from slipping endwise or turning. Referring to the prior art found in

ILLSTON 1879 ENGLISH PATENT,

I find a handle bar secured in substantially the same manner in said patent, it having a recess in the bar instead of an enlargement, as seen in figure 2 of the drawing, and is secured in position by screw-nuts in the same manner as in the Benham patent.

This Illston device will obviously operate the same practically and accomplish the same and all the results substantially the same and in the same manner as the corresponding device in the Benham patent, and therefore appears to entirely and fully contain the entire invention of said third claim of Benham.

Referring to "Complainant's Exhibits Defendant's American Champion and Light Champion Bicycles," I find their handle bars to be constructed without a detent of the character shown in Benham, but instead thereof to have a single steady-pin fixed in a recess of the head adapted to receive the handle bar and entering into a hole in the handle bar, after which the handle bar is clamped by U-shaped clips to the head of a machine instead of with screw-nuts and threads. Thus this defendants' device resembles the corresponding device of Benham much less than Benham does the English device of the Illston patent, the hand bar of defendant being clamped so rigidly to the head that it could not slip endwise if there were no steady-pin, and the steady-pin, so far as I understand it, is adapted to keep the handle bar from turning in its supports, which is a new and different construction, not embodied in the detent of Benham. Therefore I do not consider, as be-
746 fore said, that the handle-bar devices of Defendants' bicycles, American Champion, American Light Champion, and Ideal, contain the invention of the third claim of Benham.

Defendants' tricycle clearly does not contain the invention of Benham, because it has no such hand bars.

Adjourned until Wednesday, September 7, 1887, 10 oclock a. m.

WEDNESDAY, *September* 7, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

Q. 24. Please examine carefully "Complainant's Exhibit Moran 1881 Patent," particularly as to the claims 1, 2, and 3, and state whether or not you understand the same and the described mechanisms therein, and you may also in this connection compare said patent with the three defendants' bicycle structures and the single tricycle structure offered in evidence in this case as to such claims, and state whether or not you find the inventions, combinations, or

devices in said claims of said Moran patent or either of them to be contained in either or any of defendants' bicycle or tricycle structures, and give your reasons fully for your opinions; and you may in this connection refer to any of the exhibits offered in evidence by the defendants relating to this same subject-matter, stating if you understand the same, and consider such exhibits in connection with your expressed opinion in such manner as you may see fit.

A. I have examined said Moran patent exhibit and fully understand the same as relates to the specification and claims thereof, and find that the invention consists in constructing handles for the handle bar of velocipedes with a wooden core for the purpose of preventing jarring and breakage, the patentee also stating
747 at the bottom of the second column of the first page of the specification as follows: "I am aware that a rubber handle has been patented for handles, screw-drivers, etc., and therefore make no broad claim to a rubber handle, but only in its application to velocipedes, wherein it has uses and functions not contemplated in its former adaptation." From the foregoing it will be seen that rubber handles were old at the date of the invention of Moran for various purposes by his own admission; and, further, that he shows and describes a handle consisting of a wooden core covered or tipped with rubber as his invention. Comparing these Moran devices with the handle bars of defendants' bicycles, I find said handle bars to show merely rubber handles, only such as Moran admits were old, and not handles with wooden cores in them like he shows and describes or with any kind of core in them, but merely rubber handles pure and simple, consequently failing entirely to contain the invention of either or any of the claims of Moran.

Referring to the prior art relating to this subject, I find in the Harrison English patent of 1877 various rubber handles for velocipedes and illustrated in figures 4, 5, and 6 of the first sheet of the drawing, which are substantially the same in all respects as those employed by defendant, and therefore clearly and fully limiting Moran to his specific invention.

The American patent of Tyler of 1882, and which was also patented in England April 20, 1880, also shows various styles of rubber handles in the construction of which wooden cores are employed substantially like the cored and rubber handles of Moran; all of which goes to show that the Moran patent contains little, if anything, that is new in the art, and that defendants do not
748 use in their bicycles, American Champion or Light Champion, or Ideal bicycle or tricycle, such cored rubber handles as Moran describes and claims, but mere plain, ordinary rubber handles, which Moran admits are old in the art. Therefore I do not find in defendants' machines the inventions of Moran as summed up in either or any of his claims.

Q. 25. Please examine carefully "Complainant's Exhibit Whitehead 1877 Patent," particularly as to claims 1 and 2 and 3 thereof, and state whether or not you understand the same and the described mechanisms therein; and you may also in this connection

compare said patent with defendants' single tricycle structure offered in evidence in this case as to such claims, and state whether or not you find the inventions, combinations, or devices in said claims of said Whitehead patent, or either of them, to be contained in either or any of defendants' tricycle structures, and give your reasons fully for your opinion; and you may in this connection refer to any of the exhibits offered in evidence by the defendants relating to this same subject-matter, stating if you understand the same, and consider such exhibits in connection with your expressed opinion in such manner as you may see fit.

A. I have examined said Whitehead patent exhibit and understand the devices shown and described in the several claims thereof, and find the subject-matter of the patent to relate to the manner of transmitting the power from the pedals to the wheels and the particular manner in which the same is effected through the instrumentality of divers and sundry bevel and spur gears, the main reliance, however, being upon beveled gears E and F in the first and second claims and beveled gear G of the third claim.

749 On comparing these geared and driving devices of Whitehead with the gearing employed in defendants' tricycle, I find them to be radically and entirely different, the one from the other, in the fact that there is no beveled gear in the arrangement of defendants' tricycle, but merely an arrangement of spur gears and pinions within the hub of one of the wheels and a chain belt upon a pulley therefrom adapted to a pulley upon the pedal shaft. Thus this gear-driving structure of defendants' tricycle is entirely different from Whitehead and does not contain the elements of either of the combinations of Whitehead's claims, and therefore does not contain the invention of either of said claims. "Defendants' American Champion and Light Champion bicycles," neither of them show any such gearing arrangements or require them, as the pedal power is applied direct to the axis of the main wheel.

Recess.

Q. 26. In your consideration of the Benham patent do you find in the answer which you gave concerning said patent that you made any reference to the first claim thereof?

Should you find that you did not, please examine said first claim and state your conclusions relative thereto, as to the question of the infringement of said claim by the devices shown in defendants' bicycles. In any answer which you may give please refer to the prior art having a bearing upon said claim, if you so desire.

Adjourned until Thursday, September 8, 1887, 10 o'clock a. m.

750 THURSDAY, *September* 8, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

A. In my reference to the Benham patent I was under the impression that the first claim was not in litigation, and consequently made no reference to it, but will now refer to the said first claim of

Benham and state that I understand the invention of said claim to be for the combination of an undivided hand bar and an open slotted lug and two sleeve nuts or their equivalents, one on either side of the lug surrounding the bar and adapted to lock it rigidly to the lug. The foregoing is substantially the language of the first claim of Benham, and referring to the prior art I find in the Illston English patent of 1879 a substantially similar undivided hand bar in a bicycle and an open slotted lug to receive such hand bar, and two sleeve nuts, substantially identical with those of Benham, on either side of the lug surrounding the bar. These several devices are illustrated upon the first sheet of the drawing, and said sleeve nuts are adapted to lock the hand bar rigidly to the lug, the same as in Benham. Referring to the hand bar of defendants' machines, it differs from Benham in the fact of being a smooth bar continuous where it secures to the lug, and is secured to the lug by U-shaped clipps instead of sleeve nuts, and has a pivot in the lug which fits in a center hole in the hand bar to keep it from moving in either direction. Thus in detail of construction defendants' hand bar and attachments are materially different from those of Benham for the same purpose, and do not as nearly resemble Benham as Benham's devices those of the Illston patent, which, being older than Benham, must necessarily limit Benham nearly or entirely to the construction he shows, and it not being the construction, as I have
751 already stated, of defendants, does not appear to me, on account of the differences between them and the prior art, to contain the invention of the said first claim of the Benham patent.

Cross-examination by L. L. COBURN, Esq.:

C. Q. 1. Mr. Powers, you are familiar with ball-bearing devices, are you, and have made some inventions in that art?

A. Yes; I consider myself fairly familiar with them and have made some inventions in furniture casters in which oval-shaped balls were used.

C. Q. 2. How many bearings of points of contact are there in ball-bearing devices when the ball rolls in semi-spherical grooves?

A. If the curve of the ball and the semi-spherical groove corresponded in form and size, I suppose there would be only two bearings proper—one in each of the plates or housings in which they were adapted to roll.

C. Q. 3. And that bearing in each of the hemispherical grooves would be a curved line extending about half way around the ball, would it not?

A. Yes; I so understand it.

C. Q. 4. How many bearings of points of contact would there be with the ball if there were conical bearings resting against the ball instead of grooves?

A. In such case I understand there would be four points of contact merely—two in each of the receptacles.

C. Q. 5. With four points of contact against the ball would there not be less friction than there would be if there was a spherical line of contact composed of two hemispherical lines of contact?

752 A. I understand that there would be less friction with four lines of contact than there would be with a hemispherical line of contact if the balls fitted closely in the circle, though still free to turn.

C. Q. 6. If you have four conical bearings for the ball and one of them be adjustable, would not the adjustment of that one conical bearing make a complete adjustment of the ball as to all the other three points of contact as well as to the point of contact which was adjusted?

A. Yes; I so understand it, provided the outside bear- was free to adapt itself to the adjustment by a corresponding lateral movement.

C. Q. 7. I mean when the other three bearings or points of contact remain stationary, as, for instance, supposing that you put the balls in the bearings, which are conical in form, so that the ball has four points of contact and you wish to adjust so that the ball be looser or tighter in the bearing. Now, if one of the conical bearings be adjustable so as to throw it in farther toward the ball or to draw it out, causing it to recede from the ball, would not that adjust the ball relatively to all the other bearings which were not moved to not move *per se* relatively to each other?

A. No; I do not understand that such would be the fact, for the reason that moving only one side of a conical groove either out or in must change the center or line of motion to one-half the extent of the movement of the single side bearing, and to that extent it would be out of line in cross-section with the groove in the outside bearing-box.

753 C. Q. 8. Supposing the two bottom conical bearings are so far apart that the ball rests upon them a quarter of an inch from their lowest points of surface, you slide one of those conical bearings further under the ball it would raise the ball, would it not, perpendicularly, because the two bottom conical bearings then would be nearer together than they were before, and now the points of contact of the ball upon the two bottom bearings would be on the same plane but a little higher than they were before the adjustment. Is not that true?

A. On sliding the one bearing more under the ball, as stated, I do not understand that it would raise the ball in a perpendicular direction strictly, but somewhat diagonally from a vertical. I understand that such would be the position of the ball in reference to a horizontal plane.

C. Q. 9. What parts would constitute the bearings of such a structure?

A. The points of contact, as I understand it.

C. Q. 10. It would be, then, the four conical shoulders, would it not?

A. Yes; the four conical shoulders at their points of contact with the balls.

C. Q. 11. In the defendants' machines there are ball-bearings with four conical shoulders, with balls touching at four points of

contact, one point being upon each of the four shoulders, is there not?

A. I understand that the forward wheel of defendants' machines have such ball-bearings.

C. Q. 12. Do you not also find that in the defendants' machines one of these conical bearings is made adjustable, so that it can be moved in towards its opposite conical bearing?

A. Yes; I find that feature in his bearing, but the part that moves is the inner portion of the conical-shaped bearing instead of the outer.

C. Q. 13. You mean the inner in reference to its location toward the machine, do you?

754 A. Yes; toward the center of the machine.

C. Q. 14. Do you find also in these bearings of the defendants' machine that the two upper or outside conical bearings are in an undivided case, which is circular or annular in form?

A. I understand such to be the fact.

C. Q. 15. You also find, do you not, that the two bottom or inner bearings are divided so that one can be adjusted relative to the other?

A. Yes; that is the construction.

C. Q. 16. In assembling the balls in these conical bearings is it at all important that one of the conical bearings be on a sleeve on the axle so that the balls can be assembled in the bearings and then the sleeve be inserted and adjusted to its proper relative position to the balls?

A. That would appear the most convenient way of doing it, but I am not sure as it is indispensable to be done that way.

C. Q. 17. Is it at all important that these bearings be a continuous undivided or unbroken bearing in the path or paths which the balls come in contact with the bearings?

A. I should consider it preferable, as any longitudinal division across the track would impair their durability or good working.

C. Q. 18. Please look at Complainant's Exhibit Peters Patent and state how many conical bearings of points of contact there are with the conical ends of each of the rollers, as shown in figure 4?

A. I understand that those rollers have two conical bearings at each end or points of contact sufficient to keep the rollers
755 from moving longitudinally or, in the words of the specification, of keeping the rollers in place, but that their main working bearings for anti-friction purposes are upon their straight lines of longitudinal length.

C. Q. 19. One of these four conical bearings is made adjustable, is it not?

A. Yes; I so understand it.

C. Q. 20. If this adjustable bearing be adjusted beneath the end of the roller sufficiently it would raise it slightly from any contact with the axle and bring its entire bottom bearings upon the two cones, would it not?

A. Adjusting up the nut sufficiently would raise the rollers from

their main bearing, would leave them supported upon the cones, of course.

C. Q. 21. Does not the inventor say in his specification that "these rollers may be of uniform thickness throughout their length, or a part of the same may be made smaller in such places as may be desired to release them from supporting a bearing"?

A. Yes. The specification so recites that the rollers may be necked out more or less at their main bearing points if found so desirable, or in language to that effect.

C. Q. 22. Is it language to the effect that you have given it in your answer? Doesn't it mean this: That they may be made smaller or necked out, as you call it, between its conical ends to release them from supporting the bearing of the load that is upon them in those places where they may be necked out?

A. I understand the object to be to produce less of a bearing surface upon the straight line of the roller. It is customary in many cases to neck such small rollers. That is always done in spinning in woolen and cotton factories, only leaving as much straight line as is required for its work.

756 C. Q. 23. Then does not the inventor say in speaking of these rollers that "both ends are made with a bearing"?

A. Yes; he says they are made with a bearing; and goes on to say, "which goes into rings or their equivalents in such a manner as to allow the rollers to turn freely on their bearings as they revolve around the bearing of the axle or shaft;" and these bearings are simply for the purpose of keeping the rollers apart, as I understand the specification, and the device as thus constructed is shown in figure 2 of the drawing.

C. Q. 24. And when the rolls are made at the end, as shown in figure 4, the rolls are held in place, as you understand it, by the conical bearings, are they?

A. The specification says so; but the specification also says that the rollers still have rings upon them, and when the rollers are thus tapered it is because the rings are made smaller in diameter so as to slip into the hub, or language to that effect.

Thus this patent does not recognize a looser roller, as I understand it, of any form or character, or rollers without housings or cages.

C. Q. 25. Is there not in figure 4 two conical bearings in an undivided ring or annular case?

A. I do not find any such device described in the specification, as I understand it, nor shown in figure 4.

C. Q. 26. What is it that is shown in short sectional lines that you see in figure 4 next to and in contact with the rolls?

A. I understand those short sectional lines to indicate a portion of the hub of the wheel, as they are similar in character to the longer lines of the exterior portion of the hub.

757 C. Q. 27. Do you not understand that that is an annular box with two beveled shoulders that correspond to the beveled shoulders of the rollers and are intended for "the beveled shoulders of the rollers to work against"?

A. The drawing I consider very vague and as not indicating such a state of facts clearly, but the language of the specification would warrant having such shoulders in the box if desired, notwithstanding the drawing is not very clear upon the subject.

C. Q. 28. How would you make the drawing different from the drawing in Fig. 4 if you were to represent a cylindrical metallic box on the inside of the hub of the wheel, the box having at either end two conical shoulders corresponding to the beveled conical shoulders of the rollers for the beveled shoulders of the rollers to work against? Would you not make separate section lines for such a box separate from the wooden part of the hub, and would you not have those section lines parallel to each other throughout the entire section of the box and not continuous with the section lines of the wooden portion of the hub, and would you not show the conical shoulders conforming to the beveled conical shoulders of the rolls, as it is shown in Fig. 4?

A. I would indicate the exterior bevel more clearly and letter or figure it, and would show some manner in which the roller cage could be gotten inside of the hub, which, as it is now shown, would be entirely impracticable without dividing the hub longitudinally or without having one of the exterior cones removable, for which there is no means shown or described. I still continue to think it a very imperfect drawing and only thrown in as a remodification under certain circumstances, and that suggestion that the parts might be cogged together is a sheer absurdity, as the large and small ends of the bevels face each other, rendering it utterly impossib-e to cog them together. For such and other reasons that I could easily adduce I consider this modified device very imperfectly shown and described.

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C. Q. 29. I will not insist upon an answer to my question, but will ask another.

If the four beveled shoulders shown in Fig. 4 "hold the rollers in place," and there is no place shown for the ring that you have spoken of "without changing the drawing," as you have stated, there being no ring shown in Fig. 4, are you still of the opinion that it was intended that there should necessarily be a ring used in connection with the "modified form" which you have stated is shown in figure 4?

A. Yes; I am still of that opinion, for the specification reads so, and I will quote to that effect as follows: "Or the outer part of the ring may be less in width than the rollers and the ends of the rollers made to bevel or taper to the rings." The foregoing language indicates clearly that rings were intended to be used, and I see a ring in place at the left hand and in Fig. 4 having the roller bearings in it. For the foregoing description and showing, and from the further fact that nothing is said in the specification about using the device without rings, it is therefore entirely clear to my mind that the inventor intended in all cases to use rings to keep the rollers in place in their proper position.

Recess.

C. Q. 30. You have stated that there are two beveled shoulders at each end of the rollers shown in Fig. 4 of the drawings. 759 This would make four beveled shoulders. You have also stated that the bearings in a ball bearing include the four bearing points of contact with the balls. If those two statements are correct, is it your opinion that the language in the second claim of the Peters patent, to wit, the bearings with the shoulders beveled or notched, includes the four beveled shoulders—that is, the two beveled shoulders at each end of the rollers, which the specification states, for "the beveled shoulders of the rollers to work against"?

A. I consider that the devices stated in the claim includes four beveled shoulders, the claim stating that they may be beveled or notched, thus assuming that it is all the same whether they are beveled or notched, and in either case the beveled rollers might work against them in some manner, but in case the beveled shoulders and rollers were notched or cogged as the specification states, being surfaces of unequal diameters as they present their faces to each other, I fail to see how in such case they could work against each other, as the specification states, with anti-friction surfaces, and that I understand is what the rollers are supposed to accomplish upon their straight surfaces or upon their beveled ends. Further, it is obvious that the beveled ends of the rollers do not have much contact upon the beveled shoulders of the bearing as a round ball would, which only contacts at a given point, while the roller contacts the entire length of the bevel, thus being an entirely different contact from that of the ball.

C. Q. 31. If these four beveled shoulders in the bearings of the Peters patent, figure 4, and specified in claim 2, as you have stated, were brought near together longitudinally, as near as is shown 760 in the ball bearings of the front wheel of Defendant's Bicycle exhibits American Champion and American Light Champion and balls inserted instead of rollers, would not the balls have four points of contact on the beveled shoulders?

A. Yes; in case of reconstruction as stated they would have the four points of contact, such as ball bearings usually have in diagonal or the V-shaped grooves.

C. Q. 32. But you consider, do you, that putting a ball in such a bearing, making four points of contact, would be materially different from putting a roll in there to receive the four conical bearings? If you do, why?

A. I do consider that the character of the contact between the roll as shown and the ball in the groove are entirely different the one from the other, both in shape and in use. The ball device would, in the case supposed, have much the less friction because it has apparently no slipping surfaces.

C. Q. 33. Now, do you not find in the Wallace patent—Complainant's Exhibit Wallace Patent No. 1—a ball bearing in which balls are used resting against four conical bearings, each ball having only four points of contact against the conical bearings?

A. I understand the Wallace patent to show the devices stated in the question.

C. Q. 34. Are not the two upper or outer conical bearings in the Wallace patent in an annular ring or box, having no division either vertically or longitudinally?

A. Yes; I understand such to be the fact.

C. Q. 35. Is not one of the other conical bearings attached rigidly to the axle, while the other lower or inner conical bearing is upon the end of a sleeve which surrounds the axle, and is made adjustable, so that it can be inserted to its place after the balls are assembled in their places?

761 A. I understand such to be the construction of the device.

C. Q. 36. Are any of these bearings divided longitudinally to the line of the axle or cut across, or are they continuous and unbroken throughout in the line of the path of the balls as they roll on their surfaces?

A. They are none of them divided longitudinally nor across their acting surfaces.

C. Q. 37. Are not the bearings of the front wheels of the defendants' machines, American Champion and American Light Champion, made with four conical bearings, the two outer or upper bearings in a box that is not cut, either vertically or longitudinally, and is not one of the under or inner bearings fixed to the axle, while the other inner or lower conical bearing is on the end of a sleeve, which can be inserted after the balls are assembled in their places?

A. I understand the construction to be substantially stated in defendants' machine, and so stated in terms or substance in my direct.

C. Q. 38. Are any of these four conical bearings in the said defendants' machines cut longitudinally to the axle or across their faces, or are they continuous and unbroken throughout the entire path of the balls in their contact with them?

A. I understand them to be continuous in their pathway of the balls.

C. Q. 39. Is it your opinion that the four conical shoulders that bear upon the beveled ends of the rolls shown in figure 4 would be materially changed if the device be made half an inch long instead of two inches long?

762 A. It is my opinion that it would be only materially changed in the matter of length by being made shorter, but not necessarily in principle; still it is equally obvious, in my judgment, that Peters in preparing his invention had no conception whatever of a device in which he could use balls instead of rollers, or in which he could use rollers without a cage or shell in which to pivot and support them, and therefore it does not appear to me that his showing and description, taken alone, would be sufficient instruction to an ordinary mechanic in that line of business from which he would be at all likely to construct a ball-bearing device instead of Peters' caged roller device.

C. Q. 40. But if he claimed the bearing with the four beveled shoulders, and another inventor used the same four beveled or conical shoulders and inserted balls instead of rollers, would it not be

your opinion that the last inventor or improver would be subject to Peters' claim for his four beveled shoulders?

A. I do not understand that an inventor can legitimately claim anything that he does not show or describe so clearly that a third party could construct the device, and I have already said that I did not think such a skilled mechanic would make out of Peters such a ball-bearing device as is shown in Wallace and in defendants' machines without new conceptions that would amount to invention. Because Peters happens to use language in his claim that, when emasculated from part of the words in the claim, applies with more or less directness to some subsequent invention not described or indicated in his specification and drawing in such case, I do not consider that such subsequent party making a device like Wallace or said defendant could reasonably be held as an infringer of
763 the said second claim of Peters. The surplus word notched that I referred to in the claim—the word notched, it being evident that in notched diagonal grooves and correspondingly notched balls would be an absurdity; and, as I before stated, Peters uses the words beveled or notched as if they were equally applicable to his invention, not merely in his specification, but in his claim, and, as a notched device would be wholly inapplicable and impracticable as a ball bearing, it is clear that he was a long way from conceiving or giving any party instruction by which they could make a ball bearing like Wallace or defendants.

C. Q. 41. Do you think he was a long way from conceiving or showing in his patent four smooth beveled conical shoulders in his anti-friction bearing?

A. I think he showed such smooth beveled shoulders upon his bearing, and am fully aware that they were shown in older patents than Peters', as I have testified in my direct.

C. Q. 42. Are those conical bearings shown in Peters, Fig. 4, as you understand them, cut longitudinally with the axle or across their smooth beveled faces?

A. Such appears to be the fact in Fig. E, which the specification states is a segment of a circular plate for holding the rollers in place, or language to that effect. Fig. D shows the same fact, being a divided journaled box with beveled bearing surfaces cut across.

C. Q. 43. Do you understand that Fig. D shows any part of the modified form of this invention which is shown in Fig. 4?

A. I do not fully understand where he purposes using Fig. D. I think he regards it as a modification. I will quote as follows from the specification, top of second page, left-hand column: "D
764 shows a section or segment of a beveled flange for holding rollers in place, and E a section of segment of circular plate for same purpose," being two modifications which he introduces to further illustrate his invention, as I understand it, without specifying where they may be applied or used, he using the language for holding rollers instead of the rollers, thus meaning any rollers of the character of his with beveled ends.

C. Q. 44. How could such a division as is shown in Fig. 3 and D, which he describes in his patent in the same paragraph as Fig. 3

and describes as a journal box, be contained in the modified form as applied to a wheel hub of a common road vehicle without the division being shown in Fig. 4?

A. I am not prepared to say how it could be done, but only that Fig. 4, as I understand it, shows no practical division by which the roller cage could be inserted in the hub or withdrawn, if necessary, by dividing the hub longitudinally, as it is shown divided in Fig. 4, as it must be borne in mind that the hub carries a wheel upon it and must also be divided upon the rim and tire in order to introduce or withdraw the cage, as in Fig. 3—the journal box.

C. Q. 45. If a hub be made like the drawing shown in Fig. 4 of the Peters patent it could be removed from the axle by removing the beveled nut G, could it not?

A. I see nothing to hinder it being removed from the axle in that way.

C. Q. 46. It would not be necessary, then, to divide it longitudinally to remove it from the axle, would it?

A. Probably not, but in such case it is obvious that if the rollers have no securing rings they would at once drop out of place,
765 thus showing more fully that they are adapted in all cases with those securing rings and connecting rods, and that a smaller number of rollers are used than would encircle the rings fully, as do the balls in the Wallace patent and in defendants' bicycles.

C. Q. 47. If there is no securing ring they will drop out as readily as balls would, would they not?

A. Yes; I see no reason to the contrary.

C. Q. 48. You have stated that you see at the left-hand end of Fig. 4 a securing ring. Is it cut in section?

A. I stated that I was of the opinion that a securing ring was shown there, the same being cut in section, the same as the hub.

C. Q. 49. Is there one at the right-hand end also?

A. No; there is not, but there appears to be a place for one. Of course I am not stating that the drawing absolutely shows such a ring, but does in my opinion. It clearly does, or ought to, as the specification distinctly states that the roller is only beveled only when they use a smaller ring upon their ends and not when they use no ring, the foregoing being the substance of the language in the specification so far as beveling the rollers at their ends when a small ring is used.

C. Q. 50. Isn't it your opinion that figure 3 shows a journal box and journal in which rollers with rings and cage, like that shown in figure 2, is used?

A. Certainly the specification states that.

C. Q. 51. Isn't it your opinion that D shows a journal box adapted to receive rollers with beveled ends, which are for holding the rollers in place?

A. I so understand it; but I further understand that the rollers in that case would be in a cage, as the patent nowhere indicates any other construction.

766 C. Q. 52. Do you see the rings shown in figure D because they ought to be there?

A. Certainly not, as that is only one-half of the outside enclosing case or box.

C. Q. 53. Do you see at the left-hand end of figure 4 any diagonal lines such as are used in every other part of that figure where a section of any piece or part is indicated?

A. I do not notice any diagonal lines.

C. Q. 54. Do you not see shaded lines there, parallel with all the other shaded lines in the drawing, where either a concave surface or a convex surface is represented?

A. The lines may appear slightly shaded at the outside, but not more than they are at the inside of the roller bearings also, which roller bearings appear to me to rest in journals in the ring, but as they are not described or indicated by letter or figure I am not positive about it, as I before stated.

C. Q. 55. You have said that you find anti-friction bearings older than Peters' patent having four conical shoulders adapted to fit four conical bearing surfaces. Do you find such four conical shoulders in the Smith patent, 1875, that you testified about in your direct examination?

A. I stated that I think he showed such smooth beveled shoulders upon his bearing, and am fully aware that they were shown in older patents than Peters'. In that answer I want to state that he showed such smooth beveled shoulders upon his bearing and not the four beveled shoulders enumerated in the question.

C. Q. 56. You now wish to be understood, do you, that you did not say nor admit in your previous answer that there were
767 shown in figure 4 four smooth beveled shoulders, two at each end of the rollers, adapted to fit the beveled ends of the rollers of that figure in the Peters patent?

A. I am not aware that I have said there were not such four beveled faces shown in the Peters patent, but have understood that there were such faces there—two upon the inner bearing and two upon the outer.

C. Q. 57. Are there four such smooth beveled shoulders in an anti-friction bearing shown in the Smith patent, 1875, that you testified about in your direct examination, adapted to receive between them rollers having beveled ends?

Adjourned until Friday, September 9, 1887, 10 o'clock a. m.

FRIDAY, *September* 9, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

A. I do not understand that the patent does show that construction, but shows the beveled shoulders at the inner end of the axis and a nut at the outer end or upon a washer inside of the nut.

C. Q. 58. Do you find four smooth beveled shoulders in an anti-friction bearing adapted to receive and fit the beveled ends of rollers in an anti-friction bearing in the Reese patent, 1872, or the Vernon

patent, 1872, concerning which you testified in your direct examination?

A. I do not find such beveled shoulders adapted to fit the beveled ends of a roller like Peters' at both its outside and inside bevels.

C. Q. 59. Do you find four conical smooth beveled shoulders adapted to fit the ends of beveled rollers such as are shown in the Peters drawing, Fig. 4; in the Gardner patent of April, 1871, or in the Gardner patent, January, 1871, or in the White patent of 1867?

768 A. I do not find in the patents inquired about such opposite beveled shoulders specifically adapted to receive a beveled-ended roller like Peters' in either of the patents inquired about, the devices in patents inquired about being adapted for balls instead of rollers like Peters'. They only contain suggestions, as they show balls in angles and circles, still not just such angles as are shown in the fourth figure of Peters' patent.

C. Q. 60. Which patent of those that you testified about in connection with the Peters patent in your direct examination was the most nearly like the Peters in construction?

A. My idea is that the Allcott comes most nearly to the patent of Peters, it being a device adapted to the use of long rollers, substantially similar to the device of Peters in its main characteristics.

C. Q. 61. Please look at the Allcott patent, 1870, that you have just mentioned, and also at "Defendant's Exhibit Model Allcott Bearing Patent" and "Defendant's Exhibit Case" of said bearing model and "Defendant's Model No. 2 of said Allcott Bearing Patent" and state whether you find any upper or outside beveled shoulders conforming to the beveled ends of the anti-friction bearing rollers.

A. As I at present understand the Allcott patent and the models referred to I do not think there are any outside beveled shoulders shown or contained in either of them, and for the purpose of such roller bearings I fail to see any utility in such outside shoulders.

C. Q. 62. Then you do not find in any of the old patents of prior date to the Peters patent any anti-friction bearing having four smooth oppositely inclined conical shoulders adapted to fit

769 inclined conical ends of anti-friction rollers, as shown in the Peters patent, Fig. 4, do you?

A. I do not find any such arrangement of diagonal straight-faced shoulders opposite to each other transversely and adapted to receive the tapering beveled end of a roller, as is shown in Fig. 4 of the Peters patent, but find several instances of inside opposite bevels upon journals for the purpose of receiving rollers or balls, but without the outside shells, having corresponding ledges, though Allcott shows an outside shell similar in character except it has no inextending bevels at its ends.

C. Q. 63. The Wallace patent, "Complainant's Exhibit Wallace Patent No. 1," has an anti-friction bearing for a wheel and axle consisting of a one-part bearing box and a two-part sleeve; now, the two-part sleeve is a sleeve that is on the axle, is it not?

A. Yes; I so understand it.

C. Q. 64. And the one-part bearing box is a box large enough to

pass over the sleeve which is on the axle and is undivided, is it not.

A. I understand it to be of that character.

C. Q. 65. And it has a circular row of balls which have their bearing on four points of contact with the four conical surfaces, two being in the undivided box and one on each part of the sleeve that surrounds the axle, neither bearing surface of the balls being cut or divided in the paths which the balls travel, and one part of the sleeve that surrounds the axle is adjustable and entirely removable, so that the balls can be assembled in their places, then the adjustable part of the sleeve placed upon the axle, and the balls have a continuous, unbroken, inclined conical bearing with a single point of contact upon each bearing. You have stated that
770 you find in the front-wheel bearings of the defendants' American Champion and American Light Champion machines just such anti-friction ball bearing. Do you find in the Monks 1880 English patent, the Lewis 1879 English patent, the Salamon 1880 English patent, the Bate 1879 English patent, or the Smith 1877 American patent, which are all of the patents you have testified about as embodying the elements of the second claim of this Wallace patent No. 1, a ball bearing having the features and all the features which I have specified as existing in the bearing of this Wallace patent No. 1? And if you find such a bearing in all its features in either of said old patents, state which one.

A. I do not recollect having stated that defendants' bicycles, American Champion and Light Champion, had just such ball-bearing devices, but presume I said, or meant to be understood in general terms, having such a device substantially, except differing in subordinate details. It appears to me that Monks describes such an axle and anti-friction device in every detail as that enumerated in the question, it being presumed that when his loose sleeve was removed his balls could be assembled upon the other sleeve and within the cap in the same manner as stated, but the provisional specification not being accompanied by a drawing leaves that much to be inferred, and does not absolutely establish the fact that the box is undivided, but it strikes me fair to presume that such was its character; inasmuch as this outside bush is removable, it would render it unnecessary to divide his cap or box, and even if it were divided and properly made it would only be a technical difference.

The Lewis patent, as I understand it, shows two opposite beveled sleeves, one of them loose or removable, thus forming a con-
771 tinuous annular track for oval-shaped balls or partial rollers partaking of the character of oval-shaped balls and rollers, as shown in cross-section, and an outside box or cap with a corresponding groove and undivided, the construction being such that, by removing the loose sleeve, the balls or rollers could be assembled in their grooves, and the loose sleeve is adapted to be adjusted thus; as at present advised it appears to me that this Lewis patent shows substantially the same devices and combination of parts as is recited in the question. The Salamon patent shows a bearing with two sleeves, one of them movable, presenting slightly curved beveled

faces, and, as I understand, an undivided outside cap or box and a series of balls which can be assembled by removing the sleeve in the same manner; but the form of the grooves in Salamon are different from those enumerated in the question, being somewhat circular in character, and having only two contacting points apparently for the balls, and thus this Salamon patent shows an approximate device, but not one embodying specifically all of the features and forms enumerated in the question.

The Bate patent shows two sleeves upon a bearing with conical face, one of them removable, with an array of oval-formed balls, and an inclosing case in a single piece, said balls having only four contacting points and capable of being assembled by removing one of the sleeves. Thus this Bate patent, as I understand it, shows substantially all of the conditions enumerated in the question in the same relation and adapted to operate in the same manner as the device in question.

C. Q. 66. Do you find any balls shown in either the Lewis or Bate patent, and are not in each of those patents beveled-ended rollers shown of the same character and shape as the beveled-ended rollers in the Peters patent, differing only in length?

772 And have you not stated that the bearings upon beveled-ended rollers was entirely different from ball bearings in character, and that invention would be required, in your opinion, to change a mechanism from a beveled-ended roller to a ball bearing?

Also please state whether in each of these patents the bearings are the entire length of the bevel of the ends of the rollers.

And whether the same difficulty or objection with reference to one end of the roll shown in these patents being little larger or smaller than the other, and that would exist if the rolls were twice the length there shown; also whether these beveled-ended rolls in the two English patents just referred to would revolve continuously on the same axis and have the same points of contact around the beveled ends, or whether they could constantly change their axis like a ball.

Recess.

A. I do not find in the Lewis or Bate patents any balls that are spherical strictly, but oval-ended devices in the Bate and beveled-end devices in Lewis, with a certain amount of straight line at their centers; thus these oval and bevel shaped anti-friction devices approximate very nearly to balls and operate to a certain extent substantially the same as balls, although not adapted to change their axes as would a sphere. The beveled ends of the anti-friction devices of Lewis do measurably represent the beveled ends of Peters' rollers. I have stated that beveled-ended rollers operate differently from balls when they move on beveled surfaces, and that invention would be required, in my opinion, to change such mechanism as Peters shows in his fourth figure and in his patent

773 generally to a device adapted to operate balls properly and to advantage, and I am still of that opinion. In the Lewis

patent the bearings may be regarded as the entire length of the bevels, but in the Bate patent they are not, as the ends of the anti-friction devices are rounded and rest upon straight bevels. In reference to the difference as to the length of rollers if left free from housings or rings, I am of the opinion that the longer they wear the worse they would be likely to operate, and the roller or anti-friction devices shown in the Lewis and Bate patents being as short as they are they might operate fairly well without housing or any additional device to keep them parallel, while rollers as long comparatively as Peters' appear to be would, in my opinion, fail to work at all successfully as anti-friction devices unless housed or some other means employed to keep them parallel with the bearing.

C. Q. 67. Then you admit, do you not, that because the Lewis and the Bate patents shows no balls, but short rollers, that Wallace in his patent No. 1 was the first to show, so far as these patents are concerned, the perfected ball-bearing device in an anti-friction bearing having four beveled shoulders for the balls to rest against, which overcome all the objections that you find to exist in an anti-friction bearing containing rollers with beveled ends?

A. I think that Bate showed balls more nearly than rollers. As I understand his patent, the flat parallel surface of his anti-friction device did not act upon any bearing as a roller. On the other hand, the action of his device was upon four supports in his groove upon straight-line angles, substantially the same as Wallace's balls, and it does not appear to me that they can properly be called rollers; and that the Bate patent fairly and fully suggested the
774 employment of a ball if found convenient to construct and use them instead of the oval balls he shows. Of course round balls were well known at the time of Bate's patent, and I see no reason why he could not have used them as an equivalent under his patent and been entitled to have done so.

C. Q. 68. Bate calls them rollers in his patent, does he not, where he refers to them by letter?

A. I think he does call them rollers, but I don't consider that that makes them rollers.

C. Q. 69. Does he specify their length?

A. Only in his drawing, which shows them to be very short.

C. Q. 70. These rollers revolve continuously on the same axis, and must have both ends of exactly the same size, and have the same disadvantage as longer rollers excepting in degree, do they not?

A. They would have to be made substantially as the question states, and would be subject to the same extent to the same objection as longer rollers.

C. Q. 71. Bate nowhere described in his specification that the ends of his rollers D are oval instead of being conical, and the only warrant that you have for calling them oval and the bearings conical is in the drawing, Fig. 18, is it not?

A. I do not find any specific description to that effect, but the drawing clearly shows the oval form that I refer to—that is, Fig. 18.

C. Q. 72. Doesn't that drawing show lines of contact between the

ends of the rolls and the bearings instead of points of contact as you look at it?

A. They show a longer line of contact than some of the ball devices do, but no two straight lines contact, as would cones.

775 C. Q. 73. Are there any means of adjusting either of the bearings shown in the Bate patent, Fig. 18?

A. Fig. 18 does not show any screw adjustment, but Fig. 20, which relates to the same subject, does show it, being a thread in the conical sleeve and in a jam nut behind it, lettered K and L.

C. Q. 74. I did not ask you about Fig. 20, and don't you know that Bate specifically describes Fig. 18 as having the lower bearings in hexagonal form to keep them from turning on the axle? And don't you know that they could not be screw-threaded if in that form?

A. I believe he does indicate an hexagonal form, as shown in Fig. 18, which would not render it practicable to screw-thread them, but he directly describes a mode in Fig. 20 by which it is practicable to screw-thread them.

C. Q. 75. Then Wallace has a ball bearing with spherical balls instead of rollers, such as are shown in Bate, Fig. 18, and differing from Bate, Fig. 18, in having one of the bearings adjustable, does he not?

A. I so understand it, but no way differing from Monks', described in his specification, older than Wallace, Monks' even having balls instead of anything in the form of rollers.

C. Q. 76. If the Bate and Lewis patents had been prior in date to Peters' patent you do not think for a moment, do you, that they would have anticipated or in any way restricted Peters' second claim?

A. I do not think they would have anticipated Peters' invention, because he does not use a free roller. As to anticipating the claim, I am not so clear. If I were going to construe the second claim of Peters, which it isn't my business to do, I should read it in connection with the specification and drawing of the patent in a way that

776 would somewhat limit the language of the claim as it now reads.

C. Q. 77. You say in your direct examination that the second claim of the Wallace patent No. 2 has a two-part sleeve, a bearing box, a row of balls, a serrated annulus, and a locking button, with an axle and hub and flange, and you find this claim in the Monk English patent, which shows no drawing and is simply a provisional specification. What is the date of that patent?

A. May 7, 1880.

C. Q. 78. In that patent he says: "For the axle carrying the front wheel of the bicycle I employ a turned bush." What kind of a mechanism do you understand that to be?

A. A bush is usually something used about an opening to enclose something else.

C. Q. 79. Would it be cylindrical and hollow?

A. Usually a bush would be of that character, if it is a turned bush, as the language states.

C. Q. 80. Then he would have a hollow axle if he used that turned bush for the axle, as he states, would he?

A. If he used a hollow turned bush for the axle he would have a hollow axle, of course.

C. Q. 81. Isn't that what you understand by the language above quoted to be the case?

A. I do not understand anything about it without reading the description of the patent as a matter of any certainty. I am not able to construct a whole animal by seeing a single bone, as Cuvier was said to be.

C. Q. 82. The above quotation is immediately followed by the following: "Conical at the outer end and a somewhat similar
777 one, which is screwed upon the outside of the first said bush." These two quotations form an entire sentence, and will you please state what mechanism or structure you understand to be described by that paragraph?

A. I understand some portion of an anti-friction bearing device is described, but without knowing what went before and follows after I cannot state definitely what it is nor what relation it bears to the entire device.

C. Q. 83. You understand that one bush is screwed upon the outside of the other in some way, don't you?

A. The language seems to import something of that kind or sort.

C. Q. 84. You can't tell any more definitely than you have how the two bushes are made or how they are screwed together, can you, from the language that I have quoted?

A. I cannot with any certainty without the specification to read in connection. When read as a whole it has appeared to me to be plain and intelligible and to indicate substantially such a device as is enumerated in second claim Wallace's patent No. 2.

C. Q. 85. If that paragraph is all the description there is in this provisional specification in regard to the construction of the two bushes therein referred to you would not know from this provisional specification how to construct those two bushes, would you, from it?

A. I am not able to say without knowing the bearing of the entire description whether I would or would not.

C. Q. 86. What are the two bushes in the Wallace patent No. 2 which you consider to be the same as the two bushes described in the paragraph above quoted?

A. I can tell better when I learn just what the two bushes
778 are from reading the entire description, and I shall not be able to tell satisfactorily without. I am willing to stand on the ground I have taken as to the description I have given until I see I am in error.

C. Q. 87. Are there any two bushes in the Wallace patent No. 2, one of which is screwed upon the outside of the other; if so, which are they?

A. There are two devices in the Wallace patent not called bushes

in words, but one of them screws upon the other, but they are the parts which relate to an anti-friction bearing.

C. Q. 88. What parts are they and what are they called?

A. One of them is one of the cones for the ball bearings and the other is a portion of the hub of the wheel that coacts with it.

C. Q. 89. What do you understand to be the construction of a cap?

A. I do not recollect the language of the patent well enough to say without referring to it.

C. Q. 90. What would you understand the word cap as a mechanical term to mean?

A. That depends upon the machine or device it was used on or with. There is a great variety of things called caps. It usually indicates something outside, but not always, perhaps.

C. Q. 91. What do you understand by the word segmental?

A. Usually it indicates part of a circle or something circular.

C. Q. 92. Then what would you understand by the words segmental groove?

A. It would usually indicate a portion for the entire groove. It might possibly indicate one-half of the groove divided in cross-section.

779 C. Q. 93. What would you understand by the language "forms a cap somewhat circular, with a segmental groove in it for the balls to work in," to describe? I don't ask you to look at the Wallace structures for your definitions, but independently of them. I wish you to give a mechanical meaning of that language which I have quoted.

A. I understand that language to mean an outside enclosing box in the lower part of the fork, which forms a cap for the balls to work in; in other words, it is the cap outside of the cones and balls with a segmental or V-shaped groove in it; and I am warranted in that view by the language that follows, "or I may in some instances employ a double row of balls in a double groove and cone piece, as above described." In this case I understand the meaning to be that he would have two grooves in his cap—what he calls a segmental groove and a double-coned piece, as above described.

C. Q. 94. You understand, then, that when he says "which forms a cap somewhat circular" that he means a circular enclosing box, do you?

A. Yes; that is my present understanding of the language.

C. Q. 95. You get that on account of your determination to find in this language the Wallace structures, do you; and, if you do not, where do you find any definitions in any books that you have read that will warrant any such structure to be made from that language alone? If you know of any I would like to have it pointed out.

A. I get my idea from that language as it reads, and it appears to me to describe such a structure as Wallace's in his second claim or substantially like it in all its parts. I don't understand what

780 a definition is required for, as I regard it as a mere mechanical device, and if perchance there is some word in it that

might be improved it is only a common thing to find subordinate errors in the specifications and claims even.

C. Q. 96. Where does Monk locate his plate that he refers to near the end of his description?

A. I understand he locates his plate at the outer end of one of his bushes.

C. Q. 97. Where does he say it is fastened or secured to anything?

A. He states that his pawl is fastened to a plate, and that might be any part of the machine contiguous to where he wanted to secure his pawl. It might be a portion of the hub of his wheel. He states what his object is to keep his bush (what we term a sleeve) in place after adjustment, or language to that effect.

C. Q. 98. All that is your inference and no part of it anything which you find stated in the patent, is it?

A. I understand the plate to be some contiguous part of his machine, contiguous to his mill bush.

C. Q. 99. You know at once from the language used in this Monk patent that his "cap somewhat circular, with a segmental groove in it," meant an entirely circular box, and you would know that he described in the following language for the axle carrying the front wheel of the bicycle he employed a turned bush, conical at the outer end, and a somewhat similar one which is screwed upon the outside of the first said "bush"—two sleeves, one of which was not screwed upon or to the other in any way—and you get these constructions without any reference to anything outside of the language used in this provisional specification, do you?

781 A. I understand the language about the bushes to describe a device, when the two are connected, that forms a V-shaped groove, and the language further on shows the grooves are circular around the bearing in order to be adapted for the balls, which are stated to be arranged in series—that is, the groove is filled with balls; and, as to the language of the cap being somewhat circular, I understand that to refer to the outside of the cap, which is stated to be a part of the fork or main support; and I also understand that the groove for the balls to work in must be circular. It could have no other sense or meaning.

C. Q. 100. What do you understand he means by saying that one bush is screwed upon the outside of the other bush?

A. I understand that it is a socket between them by which they could be brought together or further apart by a screw device, and their beveled opposite edges forming the groove; and that the ratchet head that adjusted the two bushes, as he terms them, was upon the outer end of one of the bushes, so that when the bush and plate were turned the grooves for the balls was enlarged or ensmalled, and he used the word outside when he should have used the word within, it being a fact, however, that one bush would still be screwed outside of the other when making such a connection between them.

C. Q. 101. Can you imagine any other arrangement or device that you can make out of this language whereby you can make it plain that he had a connecting socket connecting the two bushes, and that

he did not screw one bush on the outside of the other, as he says he did; and where do you get the warrant for supposing that he had an independent socket to which both of the bushes were screwed instead of being screwed to each other?

782 A. I have not volunteered the opinion that he had an independent socket to which both of the bushes were screwed. I have explained how one bush was screwed outside of the other in a proper enough sense, and the last clause of the description clearly indicates that there was an adjusting device, else the milled head and pawl would have been useless, and this screwing of the bushes together must have furnished that adjustment, in my opinion, and in the manner that I have stated.

C. Q. 102. You are equally positive, are you, that the devices of the second claim of the Wallace patent No. 2 are shown in the Smith patent of 1877, marked "Defendant's Smith 1877 Bearing Patent"?

A. I do not now recall my having stated that this Smith device contained fully the second claim of the Wallace second patent. My recollection is that I stated in my direct — that screw devices by which its parts might be adjusted, or language to that effect.

Adjourned until Saturday, September 10, 1887, 10 o'clock a. m.

SATURDAY, *September* 10, 1887—10 o'clock a. m.

Met pursuant to adjournment.

Present: Same as before.

In order that I may be correctly understood in my description of what I considered the Monk patent device to be and how constructed and to enable the court to fully understand my idea I have caused a model to be made in conformity with my description of the Monk device, showing the two bushes of Monk, the one screwed upon and outside of the other and presenting opposite inclined ledges for a series of balls, one of them adjustable with a ratchet and pawl, and with a cap attached to the fork with an interior annular

783 groove with beveled sides to fit to and carry the exterior line of balls, and will name the exhibit Powers' Model of the Monk Preliminary Specification. I was more inclined to do this because some of the questions implied an imaginary device on my part, and I thought I would present a real one to show that my idea was a practical one in itself and in accordance with the said Monk specification, as I understood it.

(The model produced by witness is objected to as being an imaginary affair, with many parts not mentioned in the patent and not being in conformity with any description that the witness could give of any devices in his examination.)

C. Q. 103. Where was this model that you have just produced made, if you know of your own knowledge?

A. My direction was to have it made by the Gormully & Jeffery Manufacturing Company, and suppose it was made there, as Mr. Jeffery brought it in to me this morning.

C. Q. 104. You directed no workman to make it. Mr. Jeffery had it made, so far as you know, did he?

A. I directed no workman to make it, but I explained how I considered it made and should be made as I understand it. Mr. Offield and Jeffery both read my testimony, and I suggested the making of a model to exhibit, if they could have it ready for to-day. I did not specially direct where it should be made, nor did not care, if it was made in conformity with my ideas.

C. Q. 105. Will you explain to the court what parts in the Jeffery patent of 1883 are substantially the same as the parts specified in the third claim of the Wallace patent No. 2? You have stated in your direct examination that you found in said Jeffery patent the parts having all the material functions set forth in the specification of Wallace No. 2 and summed up in his third claim.

784 A. I find in the Jeffery patent referred to the combination in a ball-bearing device of a free bearing box corresponding to box G of Wallace and a shell case corresponding to E in Wallace, both of the same character substantially and serving the same purpose, as I understand it.

C. Q. 106. What are those parts lettered in the Jeffery patent?

A. Lettered M and N.

C. Q. 107. And it is your opinion that if the defendant makes the ball-bearing device like that Jeffery patent with the regard to the parts marked M and N such a device would infringe the third claim of Wallace patent No 2, is it?

A. I understand that the Jeffery patent is the oldest. Hence it would not in the nature of things infringe the Wallace patent, but on the other hand, if I understand it correctly, it shows substantially the combination and device claimed in the third claim of Wallace. It appears upon the specification that the Jeffery's application was made January 22, 1883, and his patent allowed April 17, 1883, and that Wallace's application was made March 23, 1883, and his patent allowed July 3, 1883, some two months after the Jeffery.

C. Q. 108. Do you understand that you are hired to answer the questions asked you or to try and make an argument for your side not responsive at all to the question asked?

A. Of course I understand it is my business to properly answer questions, and what I said as to priority in the patents was because of the peculiar nature of the question asked, if the prior patent infringed the subsequent one.

785 C. Q. 109. If it did it would be a mistake of the Patent Office in issuing a patent, wouldn't it? It would be an infringement all the same, regardless of date, if it was like the elements of the claim?

A. It might be a mistake of the Patent Office or a misapprehension as to facts, and the invention would belong to whoever could show they made it first.

C. Q. 110. What do you understand the open box E in the Wallace patent to be? What is its function?

A. I understand the function of that device to be for the pur-

pose of adjustment, while at the same time supporting the parts within the crank hub.

C. Q. 111. What kind of an adjustment?

A. the claim states that it is a free bearing box in the shell case E, which would imply a capability of adjustment to circumstances in such a way as not in any case to bind the other parts of the device that coworked with it.

C. Q. 112. You are of the opinion, then, that the kind of adjustment, and the kind of a free bearing box, and the kind of shell case named in this third claim of Wallace No. 2 is also found in the Jeffery patent above referred to; and if Jeffery and the other defendants in this case manufacture such a bearing as shown in the Jeffery patent, they manufacture all the elements specified in the third claim of the Wallace patent No. 2, substantially as set forth in that patent, are you?

A. I have stated that I considered that the Jeffery patent contained substantially all the elements of the Wallace patent No. 2, although I do not understand it to be an equally free bearing box in the Jeffery as in Wallace; nevertheless I understand Jeffery's bearing box to be free to adjust itself to its working parts before it is rigidly clamped in place, but not a free box after being
786 clamped, whereas Wallace's box, judging from the language of the claim and the imperfect description of it in the specification, is more or less free at all times, except not to turn round. Therefore the Jeffery bearing box I consider a free box in a certain sense, as well as the Wallace box, but not, perhaps, to the same extent when the machine is in use.

C. Q. 113. Will you please answer the last part of my last question, which I have already asked in different forms two or three times without eliciting any answer?

A. I do not understand that the Jeffery box is such a free bearing box at all times as is enumerated in the claim of Wallace; on the other hand, I understand the Jeffery box to be a rigid one when adjusted for use, and that if manufactured according to the Jeffery patent it would not infringe the third claim of Wallace's second patent, it not being such a free bearing box as Wallace's.

C. Q. 114. This, then, is your position, as the record shows, is it not? You swore in your direct examination that the bearing and bearing box shown in the Jeffery patent, or, as you there stated it, "the ball-bearing device shown and described in the Jeffery patent," was the same in combination with the free bearing box and a shell case substantially the same as that of Wallace, it being adapted for adjustment and having all the material functions and parts set forth in the specification of Wallace No. 2 and summed up in his third claim, thereby finding the Jeffery device sufficient to anticipate the third claim of Wallace No. 2. On the other hand, you now find that the bearing box of the Wallace patent is not the same, and the devices are not sufficiently similar in the Jeffery patent to the devices in the Wallace patent, so that ball-bearings made
787 like the Jeffery patent would contain the elements of the third claim and thereby be an infringement of it. In short,

the Jeffery device anticipates the third claim, but one making the device would not infringe the third claim.

A. My recollection is that I stated in my direct that the ball-bearing was of the same character—being an oval circle—as that of Wallace, and that the shell case was substantially the same, and, finally, that I did not consider there was any material difference between them as devices, and my idea was in using the word material that a loose box, after the machine was adjusted, was immaterial, worthless; that all that is required is the ability to adjust the box in its case when putting the machine in order for use, and that it is not essentially necessary to leave the box loose so that it can oscillate when the machine is being used; in other words, that the Jeffery device contained all the free adjustment function necessary and, as I am informed, all that is used in practice, and that therefore the Jeffery patent anticipated, in my judgment, everything material in the Wallace patent No. 2; and I fail to see anything contradictory in my direct or in my recent answers, including my present one. I still understand Jeffery's to be the prior patent, and, further, that Jeffery substantially anticipated everything material in the third claim of Wallace's second patent. If you will ask only one question at a time I can answer them much easier and more satisfactorily, I presume.

Recess.

Q. 115. You now say, do you not, that the machine made like the Jeffery, with the bearings shown in the Jeffery patent, would be so different from the elements of the third claim of the Wallace
788 patent No. 2 that it would not contain those elements substantially as therein described, and consequently would not be an infringement of claim No. 3 of the Wallace second patent?

A. I understand myself as saying in substance just the contrary from what is assumed in the question.

Q. 116. You said in your answer to cross-question 113 that "if manufactured according to the Jeffery patent it would not infringe the third claim of the Wallace second patent." Now, as I understand you, you say directly opposite from that answer, do you?

A. My meaning in my answer to interrogatory 113 was and is that the Wallace box is represented as having a free action without limitation, and to that extent the Jeffery box would not anticipate the claim of Wallace if construed literally as it reads; but I have continuously said that I considered the adjustable feature of Jeffery's box substantially the same in the main as Wallace's, but as a matter of degree, not to the same extent, but as fully so as the proper action of the bicycle requires; and if my answer to interrogatory 113 is not entirely in harmony with this theory it is because I stated differently from what I understood or meant to be understood, as it is evident to any one that both the boxes are free to adjustment, having spherical external forms in cases in which they can oscillate or be moved in any direction, sideways or tippingly.

C. Q. 117. You say in your direct examination that you find the second claim of the first Wallace patent to be fully and completely

met by the Bate model, Fig. 20. Did you mean by that answer what you said or did you mean that it contained a part of the elements of that claim and that the other elements could be added to it so as to make a device that would contain all the elements of claim 2?

789 A. Of course I meant to be understood that the Bate model was to be supplied with what the patent showed was omitted in the model, and, perhaps, might more properly have said in that connection, so far as it shows the material parts of the Bate patent.

C. Q. 118. This model, which is marked Bate, figure 20*a*, has parts on it that are not shown in that figure in the patent, has it not?

A. Yes; there is a crank and pedal piece that are not shown in the model, Fig. 20 *a*, but I did not point out these additional pieces because I clearly understood them to be accompaniments in the device; not necessary to refer to them, as nothing is claimed on them.

C. Q. 119. Then when you swore that the claims of the Wallace patents were fully shown in the models, Bate, figure 20, and Lewis, figure 3, 1879, you didn't mean that these models showed all the elements of the claim, but that they might have been made so as to show them, did you?

A. I meant so far as the models went or exemplified the patents that they were made from.

On account of having to leave for the East to attend to the taking of testimony under notices given by the defendants, it is stipulated that the further cross-examination of this witness may be postponed until such future time as will suit the convenience of the counsel in the case, and if the counsel for complainant does not notify counsel for defendant that he is ready to proceed with the cross-examination the signature of the witness to the deposition is waived by agreement, and the deposition as it now stands may be used the same as if fully completed and signed. If, however, counsel for complainant notifies counsel for defendant that he wishes to

790 proceed with the cross-examination of this witness, the witness is to be produced for further cross-examination, if said notice is given prior to the 20th of October or within the time thereafter to which the taking of testimony may be extended, if any further extensions of time are made in the case.

DAVID J. POWERS.

Subscribed and sworn to this 31st day of October, A. D. 1887, before me—

[SEAL.] FREDERICK C. GOODWIN,
Notary Public.

United States Circuit Court, Northern District of Illinois.

THE POPE MANUFACTURING COMPANY
vs.
GORMULLY AND JEFFERY MANUFACTURING COMPANY *et al.* } In Equity.

To Messrs. Coburn & Thacher, solicitors for complainant:

Please take notice that on Tuesday, the 13th day of September, A. D. 1887, at 10 o'clock a. m., we shall proceed to take testimony on behalf of defendants, to be used upon the hearing of the above-entitled cause, at Wilbur's hotel, Fall River, Massachusetts, before a notary public or other competent officer.

The taking of testimony will continue from day to day until completed. You are invited to be present and cross-examine.

Chicago, Ill., Sept. 9, 1887.

OFFIELD & TOWLE,
Solicitors for Defendants.

791 Service of above notice by copy acknowledged this 9th day of September, A. D. 1887,

COBURN & THACHER,
Solicitors for Complainants.

United States Circuit Court, Northern District of Illinois.

THE POPE MANUFACTURING COMPANY
vs.
GORMULLY AND JEFFERY MANUFACTURING COMPANY *et al.* } In Equity.

At the city of Fall River, in the county of Bristol and State of Massachusetts, on this 13th day of September, 1887, at 2 p. m., at my office, 5 South Main street, before me, Alfred H. Hood, a notary public in and for said county of Bristol, personally appeared Lewis L. Coburn, Esq., of counsel, and representing complainant, and Charles K. Offield, Esq., of counsel, and representing defendants, and thereupon the following proceedings were had pursuant to notice hereto attached.

Defendants called as a witness in their behalf JOHN SMITH, who, being first duly sworn to state the truth, the whole truth, and nothing but the truth, deposes as follows in answer to interrogatories of Mr. OFFIELD:

Q. 1. Please state your name, age, residence, and occupation.

A. My name is John Smith; age, forty-two; residence, Fall River, Massachusetts; my present occupation is police officer.

Q. 2. For how long a time have you been a police officer in Fall River?

792 A. Seven years and a half.

Q. 3. What was your occupation and where did you reside for five years prior to that time, or since the 1st of January, 1875?

A. Occupation, blacksmith, and I resided in Fall River.

Q. 4. Are you the patentee of letters patent dated November 20, 1877, and No. 197,421?

A. Yes.

Q. 5. When did you first turn your attention to anti-friction devices, consisting of balls, to produce this result in vehicles of travel?

A. Six months prior to the time I made my application.

Q. 6. Did you ever make more than one application or take out any patent other than the one just called to your attention pertaining to anti-friction?

A. I applied for a patent for a fifth wheel anti-friction ball-bearing, but nothing else prior to this.

Q. 7. In what form or shape, prior to the application for this patent, September 1, 1877, did you make known or express your knowledge or designed use of balls in anti-friction devices?

(Counsel for complainant objects to the question and all testimony that this witness may give relative to any manufacture or use of any devices for the following reasons:

1st. Because no prior use or manufacture of any of the inventions shown in the patents named in the bill of complaint is set up in the answer as having transpired at Fall River, Massachusetts.

2d. Because the name of this witness is not set up in the answer as a witness having knowledge of prior use of any of said inventions.)

793 A. I made it known by numerous drawings bearing anti-friction principles, after which I caused a model to be made which I considered to be the most binding in my invention, and this I had patented November 20, 1877; application filed September 1, 1877.

Q. 8. Please look at the two drawings now shown you and the photograph, and state who ordered those drawings made as they appear, when they were made, and who made the device from which the photograph was taken, and when it was made.

A. I made them myself. I commenced on the anti-friction axle six months before I applied for a patent, and these drawings are the result of my study between that time and my application. I made the device for the purpose of sending to the Patent Office, thinking to get different designs into my patent, but was informed that I could only get one model patented, and therefore never sent this photograph.

Q. 9. Do you mean that you never sent to the Patent Office, prior to September 1, 1877, the anti-friction device made by you and shown by the photograph, for the reasons given?

A. I never sent the photograph but had sent the model, a drawing of which appears on my letters patent.

Q. 10. Had you made a device from which this photograph was taken prior to September 1, 1877?

A. Yes.

(Defendant's counsel here offers in evidence the two drawings and

the photograph identified by the witness and requests that they may appear in this record and be marked "Defendant's Exhibits Smith Drawing No. 1," "Smith Drawing No. 2," and "Smith Photo-
794 tograph." The introduction of these drawings and photograph is objected to as immaterial and for the reasons above given.)

Q. 11. Please look at the device now shown you and state what it is and when it was made.

A. That device is an invention made by myself, and the work performed by a mechanic after my own drawings, the mechanic omitting a thread on the end of the main shaft which holds the piece that contains the groove in which the balls revolve.

The drawings of this was sent to the mechanic in August, '77, at which month the model was made. I can't give the day.

(Defendant's counsel here offers the device just testified to by the witness and requests that it be marked "Defendant's Exhibits Smith Original 1877 Ball-Bearing Device." Objected to as before stated.)

Q. 12. I call your attention to "Smith drawing No. 1," "Smith photograph," and your original "ball-bearing device," just offered in evidence, and ask you if there is any difficulty by means there shown in adjusting the parts so as to cause tightness or permit looseness in the balls in their channel of travel or to tighten up the parts to compensate for the wear or wasting of the balls in practical use?

A. It can be easily adjusted by removing the check-screw "*b*" and moving the collar which contains the groove one thread; then replace the check-screw.

Also by facing off the plate *h*, making it less, thus narrowing the groove in the hub.

Q. 13. Did you ever advertise your patented anti-friction axle by circular, distributed to the general public or the trade; and, if so, have you one of your advertising circulars here?

795 A. I have placed circulars in the hands of many people, the same as I have here, in the form of pamphlet, which contains a certificate of durability from William B. Durfee, dated February 8, '78.

Q. 14. Is this the circular?

A. That's the circular.

(Defendant's counsel here offers this circular and request- it may be marked "Defendant's Exhibits Smith 1878 Circular.")

Q. 15. I see by this circular that you state that your invention, in active service, can be seen at the stable of Mr. Elihu Kirby, on Third street, in Fall River. In what shape and form was your invention then used by Mr. Kirby?

A. The axles in use by Mr. Kirby were made in compliance with a drawing made by myself, the principles of which are fac-simile of this photograph, described "Smith's photograph."

Q. 16. Where and in what manner and for how long did Mr. Kirby use the ball-bearing axle referred to in your circular exhibit?

A. Mr. Kirby commenced using the anti-friction axle referred to in the winter of '79 and '80 and used the same for nearly two years, in the city of Fall River, upon a hack.

Q. 17. Look at the device now shown you and state what it represents and who made it.

(Objected to for reasons given above.)

A. That device is an axle manufactured by Albro & Chace, a firm then existing in Fall River, in the winter of '79 and '80, and manufactured in compliance with my original drawing No. 1.

Q. 18. Where has it been ever since?

796 A. It has been in my cellar until last spring.

Q. 19. Who furnished the balls now appearing in this axle?

A. Mr. Jeffery furnished those balls, at my request, either in February or March, 1887.

(Defendant's counsel here offers in evidence the axle just testified to by the witness and requests it may be marked "Defendant's Exhibit One of Smith's Original Axles.")

(The introduction of said exhibit is objected to for reasons given above.)

Q. 20. You have sold your patent to one of the defendants in this case, have you not?

A. Yes, sir.

September 13, 1887.—Adjourned to 9.30 to-morrow forenoon, September 14, 1887.

SEPTEMBER 14, 1887.

Met as per adjournment of yesterday.

Q. 21. Who made the axles with the four bearings that were used on the Kirby hacks mentioned in the circular exhibit?

A. Kilburn & Lincoln, of this city.

Q. 22. Who had the axles made for the Kirby hacks, and were they made with your consent?

A. Henry Fields, and with my consent.

Q. 23. Is Henry Field now living?

A. No, sir; he is dead.

Q. 24. You have given the time, as I understand you, when these axles made by Kilburn & Lincoln were used in the Kirby hack. Do you know what time these axles were actually manufactured by Kilburn & Lincoln to go into the hack?

797 A. From minutes taken from Kilburn & Lincoln's books they were manufactured in March, 1878.

Q. 25. Was this ball-bearing axle marked Defendant's Exhibit One of Smith's Ball-Bearing Axles made before or after Kilburn & Lincoln manufactured those axles for Field, in March, 1878 (to go into the Kirby *back*)?

A. It was manufactured after, from original drawing No. 1.

Q. 26. How long after was it manufactured?

A. About one year.

Q. 27. Please look at the device now shown you and state what it is.

A. It is an axle made by Kilburn & Lincoln in March, '78, for Henry Fields and from my drawing.

Q. 28. Is this one of the axles used in the Kirby hack, as you have testified?

A. Yes.

Q. 29. Where are the balls and the hub and the nut to this axle, if you know?

A. I don't know; they have been misplaced.

(Defendant's counsel here offers in evidence the axle referred to by the witness and requests that it may be marked "Defendant's Exhibit Smith-Kirby 1878 Axle.")

(The introduction of this exhibit is objected to for reasons above given.)

Cross-examination by L. L. COBURN, Esq.:

C. Q. 30. To whom did you sell this patent dated November 20, 1877?

A. Thomas B. Jeffery.

C. Q. 31. When?

A. February, '87.

798 C. Q. 32. How much did you get for it?

A. $350.

C. Q. 33. How do you know that that axle is the identical axle that was used in the Kirby hack?

A. Marks on the axle, caused by an accident.

C. Q. 34. Did you see the accident?

A. I saw the axle soon after the accident occurred.

C. Q. 35. How long before this morning was it that you last saw the axle?

A. Twenty-four hours.

C. Q. 36. How long before that had it been since you saw it?

A. Can't remember; have not seen it since the accident occurred until yesterday morning.

C. Q. 37. Did the accident occur several years ago?

A. Yes.

JOHN SMITH.

COMMONWEALTH OF MASSACHUSETTS, *Bristol,* } *ss:*

SEPTEMBER 14, 1887.

Subscribed and sworn to this day before me—

ALFRED H. HOOD,

[SEAL.] *Notary Public.*

And thereupon defendants called as a witness in their behalf URIAH KIRBY, who, first being duly sworn to state the truth, the

whole truth, and nothing but the truth, deposes as follows in answer to interrogatories propounded by said OFFIELD:

Q. 1. Please state your name, age, residence, and occupation.

A. My name is Uriah Kirby; age, sixty-one; residence, Fall River; occupation, foreman of a stable.

799 Q. 2. How long have you lived continuously in Fall River?

A. Lived here since September 1, 1859.

Q. 3. Please look at this axle now shown you and marked "Defendant's Exhibits Smith-Kirby 1878 Axle" and state when, where, and under what circumstances you first saw this axle and became familiar with it.

A. As regards when, I don't just recollect. It was some eight or ten years ago, perhaps, in my brother's stable, where I was employed. The circumstances were, Mr. Smith, the patentee, put the axle and wheel on a hack of my brother's in the stable where I was employed.

Q. 4. How long was this identical axle in use on your brother's hack in Fall River?

A. I couldn't say exactly; from one to two years; perhaps a year and a half.

Q. 6. How constantly was your brother's hack in use during that time with this axle?

A. Part of the time it was used only to attend to orders at funerals, etc., and a part of the time it was run as a hackney carriage to the depot.

Q. 7. State particularly for what reasons the axles like this exhibit were finally taken off your brother's hacks.

A. The caps that hold those balls in got broken; a portion of them lost on the street, and knew not where to get any more to get them repaired, so took them off and put on another kind.

Q. 8. Did you have charge of this hack of your brother's while these axles were upon it?

A. No; he had charge of it.

Q. 9. What, if anything, did you have to do with this hack while these axles were upon it?

A. At times I drove it to funerals.

800 Q. 10. Who had charge, next to your brother, of his stable while these axles were upon the hack?

A. I did.

Q. 11. Is your brother living?

A. No, sir.

Cross-examination by L. L. COBURN, Esq.:

C. Q. 1. How long before to-day was it since you saw this axle?

A. That axle lay where I passed by it every day.

C. Q. 2. How long did it lay there?

A. It has been there or near that spot ever since it was taken off the hack.

— Q. —. What spot?

A. In the lower carriage-house near one corner.

C. Q. 4. Whose carriage-house?

A. Elihu Kirby's.

C. Q. 5. Have you continued to work in the stable since your brother's death?

A. Yes, sir.

C. Q. 6. How long has he been dead?

A. He died a year ago last April.

C. Q. 7. Who owns the stable now?

A. His widow.

URIAH KIRBY.

COMMONWEALTH OF MASSACHUSETTS, *Bristol,* } *ss:*

SEPTEMBER 14, 1887.

Subscribed and sworn to this day before me—

[SEAL.] ALFRED H. HOOD,
Notary Public.

Adjourned to 2 o'clock this p. m., September 14, 1887.

801 And thereupon defendants called as a witness in their behalf GILMAN P. JEWETT, who, being first duly sworn to state the truth, the whole truth, and nothing but the truth, deposes as follows to interrogatories propounded by C. K. OFFIELD as follows:

Q. 1. Please state your name, age, residence, and occupation.

A. Gilman P. Jewett; forty-nine; residence, Lynn, Massachusetts; occupation, carpenter.

Q. 2. How long have you lived continuously in Lynn, Massachusetts?

A. About thirty years.

Q. 3. What relation, if any, are you to David Jewett, of Lynn, Massachusetts, patentee of letters patent dated May 26, 1868, and numbered 28210, for improved car-axle boxes?

A. Son.

Q. 4. Please state whether or not at the time your father made the invention disclosed by said letters patent you were familiar with the uses and purposes with which your father put the invention of the patent.

A. Yes, sir.

Q. 5. To your knowledge at the time this patent was granted your father, or during the next year following—*i. e.*, 1869—in what devices and for what purposes did your father use or permit the invention of his patent to be used?

(Objected to for reasons given above.)

A. First he used them on velocipedes and then used soon after on carriages built and run about that time.

802 Q. 6. Have you one of the original hub bearing- used by your father in the manufacture or use of velocipedes or bicycles in the year 1869?

(Objected to as leading.)

A. Yes; I have.

Q. 7. Please look at the device now shown you and state, so far as the metal part is concerned, what it is and when it was made.

A. This shows the device applied to an axle on velocipedes as running in 1869.

Q. 8. State whether or not this is one of the original devices used by your father on his velocipedes in 1869, so far as the metal portion is concerned.

A. Yes, sir.

Q. 9. How many velocipedes did your father have in 1869 which had ball bearings?

A. I can't state the exact number; somewhere from twenty to thirty.

(Defendants' counsel here offers in evidence the device testified to by witness and requests that the same may be marked "Defendant's Exhibit Jewett 1869 Ball-Bearing Velocipede Hub.")

Q. 10. In what manner in the year 1869 did your father use his ball-bearing velocipedes? Describe the place and surroundings.

A. On Nahant beach, in Massachusetts, in a rink built on the beach in a quarter-circle floor, running about one-eighth of a mile.

Q. 11. Did your father have any person associated with him in operating these velocipedes? If so, who?

A. It went under the name of Jewett & Leach's velocipedes.

Q. 12. Was that Mr. Albert Leach to whom your father assigned an interest in his patent?

803 A. Yes, sir.

Q. 13. Do you know whether or not any photograph was ever taken in 1869 of this rink of your father's and Mr. Leach's showing the rink and the velocipedes?

A. Yes, sir.

Q. 14. Please look at the picture now shown you and state what it is.

A. This picture will show you the device of the running of the velocipedes as it represents in the photograph like the model.

Q. 15. When was this photograph taken, and where has it been ever since?

A. Taken in same year of '69, and been in my mother's house ever since.

(Defendants' counsel here offers in evidence the photograph testified to by the witness and requests that it may be marked "Defendant's Exhibits Photograph Jewett & Leach 1869 Velocipede.")

(Objected to as immaterial and for reasons given above.)

Q. 16. You spoke awhile ago about your father's invention being used in 1869 on a wagon axle. Upon whose wagon axle was it used, and where did that axle or wagon run?

A. George B. Fuller, of Lynn, and was run in Lynn and was built in Lynn.

Q. 17. Have you a model of that axle as it was built and run in

Lynn on the Fuller wagon in the year 1869? I mean a model made at the time the Fuller axle was constructed, in 1869, so far as the bearing of the axle is concerned, and which has been kept ever since.

(Objected to as leading.)

A. Yes, sir.

804 Q. 18. Please look at the device or model now shown you and state what it is.

A. A cone with an adjustment.

Q. 19. Well, state whether or not this is a model of the bearing part of the Fuller 1869 wagon and made at that time.

(Objected to as leading.)

A. Yes, sir.

(Defendants' counsel here offers in evidence the model just described by the witness and requests it may be marked "Defendant's Exhibit Model Ball-Bearing Fuller Wagon 1869.")

Q. 20. Is Mr. Albert Leach living?

A. No, sir; he is not.

Q. 21. Is your father living; and, if so, how old is he, and how is his condition of eyesight and memory?

A. Seventy-five. His eyesight and memory rather fail him.

Q. 22. Prior to the year 1870 was your father's invention ever used in pulleys at or near Lynn, Massachusetts; and, if so, have you one of those original pulleys with you?

A. Yes, sir.

Q. 23. Please look at the pulley device now shown you and state when it was made, except the steel shaft upon which it revolves.

A. Made the year '70 to '71, and used in Rockport, Massachusetts, on derricks; also used in South Boston.

Q. 24. Is this one of the original pulleys made in 1871?

A. Yes, sir.

805 (Defendants' counsel here offers in evidence the pulley identified by the witness and requests that it may be marked "Defendant's Exhibit Jewett-Leach 1871 Ball-Bearing Pulley.")

Cross-examination by L. L. COBURN, Esq.:

(The deposition of this witness is objected to and also the model and exhibits are objected to because no sufficient ground is laid in the answer for the testimony elicited from this witness; also because the witness has not stated sufficiently any facts relating to the matters inquired about to show that he knows accurately the construction of the devices inquired about, and also because the questions have been leading, and the witness has only sworn to the statement made by counsel, both as to dates where dates were important and as to construction where construction was important.)

Cross-examination waived.

GILMAN P. JEWETT.

COMMONWEALTH OF MASSACHUSETTS, } ss:
Bristol, }

SEPTEMBER 14, 1887.

Subscribed and sworn to this day before me—
ALFRED H. HOOD,
[SEAL.] *Notary Public.*

806 Thereupon the defendants called as a witness CHARLES BUFFINGTON, who, being first duly sworn to state the truth, the whole truth, and nothing but the truth, deposes as follows to interrogatories propounded by C. K. OFFIELD, Esq.:

Q. 1. State your name, age, residence, and occupation.

A. Charles Buffington; forty-eight years old; machinist; Fall River.

Q. 2. In whose employment are you, and how long have you worked there?

A. Kilburn & Lincoln & Co.; since July 16, 1866.

Q. 3. Did you ever make, while in their employment, a ball-bearing axle for a carriage; and, if so, when was it made, and whom for?

A. As to the date I can't tell anything about that. A man by the name of Smith ordered it, and it was charged to a man by the name of Henry Field, now dead.

Q. 4. Would you know that axle again if you saw it?

A. If it was in the same shape as when I delivered it I should.

Q. 5. Please look at the axle now shown you, marked "Defendant's Exhibit Smith-Kirby Ball-Bearing 1878 Axle," and state whether or not this is the axle made by you and above described.

A. I should say the ends was the same one. All I made was the ends. The center of the axle was welded on—pieced out to make the length.

Q. 6. Did you make these ends recently or a great many years ago?

A. I made them some years ago; not within five years.

807 Q. 7. Look at the bill now shown you and state if it correctly represents the work done on that axle?

A. I should say it did, as far as I can recollect.

(Defendants' counsel here offers in evidence this bill and requests it may be marked "Defendant's Exhibit Kilburn & Lincoln Bill, Smith-Kirby Axle.")

(Counsel for complainant objects to this deposition for the reasons heretofore stated as to the other depositions taken at this sitting, and for the further reason that the questions are leading, the witness not having been asked to describe what work he did.)

Cross-examination waived.

CHARLES BUFFINGTON.

COMMONWEALTH OF MASSACHUSETTS, *Bristol*, } ss:

SEPTEMBER 14, 1887.

Subscribed and sworn to this day before me—
[SEAL.] ALFRED H. HOOD,
Notary Public.

Adjournment then taken until to-morrow morning, September 15, 1887, at 10 o'clock in the forenoon.

808 Met, as per adjournment, at 2 p. m.

Thereupon the defendants called as a witness in their behalf CHARLES P. LEACH, who, being first duly sworn to state the truth, the whole truth, and nothing but the truth, deposes as follows to interrogatories propounded by C. K. OFFIELD, Esq.:

Q. 1. What is your name, age, residence, and occupation?

A. Charles P. Leach; fifty-one; 437 Western avenue, Lynn; manufacture shoe trimmings.

Q. 2. How long have you lived in Lynn, Massachusetts?

A. Twenty-seven years.

Q. 3. Did you know David Jewett and Albert Leach, of Lynn, Massachusetts, to whom letters patent were granted for an axle box May 26, 1868, and numbered 78210, which I now show you?

A. I did.

Q. 4. What relation was Mr. Leach, of this patent, to you?

A. My father.

Q. 5. Without asking you a number of separate questions, please go on and state in what kind of machines or devices your father and Mr. Jewett used the inventions of this patent, if at all, to your knowledge, prior to the year 1872.

Describe how the inventions of the patent were used.

(Objected to as immaterial and because no ground for such evidence was laid in the answer in this cause.)

A. Well, they used it on velocipedes, sheaves. Well, it was used on a carriage.

809 Q. 6. We will take the velocipede first, and please state when, where, and for how long the inventions of this patent were used on velocipedes by your father and Mr. Jewett.

A. On Nahant beach, in the summers of '69 and '70.

Q. 7. What kind of a place was it where these velocipedes were used, and who owned the place in '69 and '70?

A. Place of amusement, owned by A. Leach and Son.

Q. 8. Who was the son?

A. Myself.

Q. 9. What, if anything, did Mr. Jewett have to do with this place?

A. He had an interest in the income from letting the bicycles or velocipedes—I don't know which you would call them.

Q. 10. How many bicycles or velocipedes were run at this place of amusement in '69 and '70?

A. About forty.

Q. 11. For how many months or weeks in each year were these bicycles run?

A. About sixteen weeks.

Q. 12. In what manner were the inventions of this patent of your father and Mr. Jewett used in these bicycles? Describe how.

A. There is the description of it.

Q. 13. Do you mean this model marked "Defendant's Exhibit Jewett 1869 Ball-Bearing Velocipede Hub"?

A. I do.

Q. 14. State whether or not the metallic part of this model is one of the original and identical parts of one of those bicycles used in '69 or '70.

810 A. It is.

Q. 15. Were all the other bicycles equipped with these same parts?

A. They were.

Q. 16. Please state, Mr. Leach, how extensively these bicycles containing these ball-bearing devices were patronized by the public at your father's place during 1869 and '70.

A. Very extensively.

Q. 18. What kind of satisfaction did they give in comparison with bicycles then running having a plain bearing between the wheel and axle?

A. They gave better satisfaction than the plain bearing.

Q. 20. What did you personally have to do with the management of this place of amusement? How much were you there in 1869 and '70?

A. To look after the supplies, and was there during some part of every day during the season.

Q. 21. Was any photograph ever taken of this place of amusement; and, if so, when?

A. Several of them; in 1869.

Q. 22. Please look at the photograph now shown you and state what it is (showing witness defendant's exhibit marked Photograph Jewett and Leach 1869 Velocipede).

A. Picnic park, Long beach or Nahant beach. It is known by both names.

Q. 23. Is this the place of amusement of your father and you as described by you and run in 1869 and '70?

A. It is.

Q. 24. Was this place run after 1870 for velocipedes or bicycles?

811 A. It was not.

Q. 25. You have spoken of the inventions of this patent being used on a wagon. Please state on whose wagon it was used.

A. George A. Fuller's.

Q. 26. Where and for how long was this wagon run containing the invention of this patent?

A. In Lynn about a year.

Q. 27. For what purpose was the wagon used generally and was it successful in its operation, especially as to its hub-bearing parts?

A. It was used to show the practicability of ball bearing and proved as success.

Q. 28. During what year or years was this Fuller wagon run?

A. A portion of '70 and '71.

Q. 29. Mr. Leach, please describe exactly in what manner the invention of this Jewett-Leach patent was put into the hub-bearing part of this Fuller wagon. Describe the parts.

A. That is the exact model of it (referring to defendant's exhibit marked "Model Ball-Bearing Fuller Wagon 1869").

Q. 30. Who made this "Model Ball-Bearing Fuller Wagon 1869," and when was it made?

A. I made it in 1870.

Q. 31. What was it then made for?

A. To show people how the wagon was built and running on balls.

Q. 32. In whose possession has this model of the Fuller hub been ever since?

A. My own.

Q. 33. How much of the Fuller hub and what part does this model represent?

812 A. One end.

Q. 34. Where is Mr. Fuller now?

A. He is supposed to be in Jerusalem.

Q. 35. What became of the Fuller wagon on which this device was placed?

A. The wheels were taken apart to show people the success of ball bearing.

Q. 36. What particular object or purpose did you then have in view for showing people the success of ball bearing?

A. To show people that the Jewett & Leach patent was a valuable one.

Q. 33. Please look at the axle now shown you, marked "Defendant's Exhibit One of Smith's Original Axles." Examine it carefully and state to what extent, if at all, this axle represents the axle run for a year on the Fuller wagon as described by you.

(Objected to as leading.)

A. Very nearly the same thing.

Q. 34. What, if any, difference is there between the two axles? Point out such differences.

A. The nut and shoulder on the Fuller wagon had a little more bevel.

Q. 35. Any other differences?

A. No, sir.

Q. 36. You have spoken of the invention of the patent being embodied in a sheave. State what year they were so embodied and describe such sheave.

A. '69. There is a model sheave (witness pointing to defendant's exhibit marked "Jewett-Leach 1871 Ball-Bearing Pulley").

Q. 37. When was the model or sheave just referred to by you made and where has it been ever since?

813 A. Made in '69, and been in my possession.

Q. 38. For what purposes and how extensively, if at all, were sheaves like this exhibit or model publicly used at or near Lynn in the year 1869 or '70?

A. There never was but a few pairs of sheaves used to my knowledge; used for ship blocks.

Cross-examination by L. L. COBURN, Esq.:

C. Q. 1. You made this model, marked "Defendant's Exhibit Model Ball-Bearing Fuller Wagon, 1869," yourself, did you?

A. I did.

C. Q. 2. Were did you make it?

A. In Lynn.

C. Q. 3. Where in Lynn?

A. At my shop, in the yard of my house.

C. Q. 4. Who told you how to make it, if any one?

A. No one.

C. Q. 5. Was it made before or after the Fuller wagon was made?

A. After; I copied from that.

C. Q. 6. Who made the Fuller wagon?

A. I don't know who made the wagon. I know who made the wheels.

C. Q. 7. Who made the wheels?

A. A man by the name of Buzzell.

C. Q. 8. Do you know his first name?

A. I am pretty sure his name is John. He run a machine shop there at that time.

C. Q. 9. Did you see him at work making the wheels?

A. I did not.

814 C. Q. 10. Did you see him making them from any drawings?

A. I did not.

C. Q. 11. Did you hear any one tell him how to make them?

A. No.

C. Q. 12. Where did George A. Fuller keep this wagon while these wheels which were made by Mr. Buzzell were on it?

A. In his own private stable, on Franklin street, Lynn.

C. Q. 13. How far was that from your shop?

A. Less than one eighth of a mile. I lived on the same street.

C. Q. 14. These wheels were taken from the wagon after about one year from the time they were first put on, were they?

A. Yes, sir.

C. Q. 15. And taken to pieces at that time to show how they were made with ball bearings, were they?

A. They were.

C. Q. 16. Did you make the model for the purpose of showing people how ball bearings could be used?

A. That was my object in making it.

C. Q. 17. You took a little wooden box, a common wooden pill box, for one part of it, didn't you?

A. Yes, sir.

C. Q. 18. Why didn't you show both ends of the hub?

A. I wa'n't so much for showing the hub as I was for showing the principle of the invention.

C. Q. 19. Did you make this model, marked "Defendant's
815 Exhibit Model Ball-Bearing Fuller Wagon, 1869," identically like one end of the hubs that were on that Fuller wagon for about a year?

A. I did, sir.

C. Q. 20. Those wagon hubs were made differently from the drawings of this Jewett patent, issued to David Jewett & Albert Leach, dated May 26, 1868, and numbered 78210, which I now show you, were they?

A. I suppose their claims were broad enough to allow deviations. Yes; they were made slightly differently.

C. Q. 21. Point out the difference. What part of those drawings before you differ from the ball bearings in that Fuller wagon?

A. That I can't answer. I can't tell more about drawings than a cow; that's the truth.

C. Q. 22. When did you give this model marked "Defendant's Exhibit Model Ball-Bearing Fuller Wagon, 1869," to Mr. Jeffery?

A. I don't know exactly. It may be five months ago. I can't tell exact.

C. Q. 23. You haven't seen it since until to-day, have you?

A. I have not, sir.

C. Q. 24. How do you know that this model marked "Defendant's Exhibit Jewett 1869 Ball-Bearing Velocipede Hub" is one of the original hubs made in 1869?

A. I recognize it as such same as you would an old friend after he had been gone fifteen or twenty years; it looks familiar.

C. Q. 25. You say you had a shop in the yard of your house. What kind of a shop was it?

A. Blacksmith shop.

C. Q. 27. Were you at work at that time blacksmithing?
816 A. I was not. I hired two blacksmiths at that time.

C. Q. 28. What was your trade or business then?

A. Manufacturing rubber cement.

C. Q. 29. How many men did you employ at that?

A. My father and myself and two hired men.

C. Q. 30. How long did you continue in that business and when did you engage in the shoe-finding business?

A. Been in the shoe-finding business about eight years; from '65 to that time in the rubber cement business.

CHARLES P. LEACH.

COMMONWEALTH OF MASSACHUSETTS, *Bristol,* } *ss:*

SEPTEMBER 15TH, 1887.

Subscribed and sworn to this day before me—

ALFRED H. HOOD,

[SEAL.] *Notary Public.*

By agreement of counsel certificate is hereby waived.

ALFRED H. HOOD,

[SEAL.] *Notary Public.*

817 DEFENDANT'S EXHIBITS GORMULLY'S LETTERS OF MARCH 12, '83, MAY 1, '83, JUNE 23, '84, OCTOBER 20, '84, OCTOBER 29, '84, NOVEMBER 12, '84, NOVEMBER 28, 1884.

MARCH 12TH, '83.

The "Pope M'f'g Co.," Boston, Mass.

GENTLEMEN: Yours of the 10th inst. just at hand, and in reply would say that I have taken a good deal of time considering the license you submitted to me for signature, and have concluded it will not do in its present form, and your reply does not help the matters. You ask me to bind myself not to sell bicycles below a certain price and a fixed discount, so that I will not compete with the St. Nicholas and Western Toy Co. You have granted them an unconditional license. They can make bicycles as good as they like and sell as low as they like. I am informed that whenever an improvement has been made they at once adopt it and still sell at the same price. What chance would I have if I was to make brass hubs and ball bearings and generally an improved class of machine? They would at once follow suit with quality and still have the power to cut me right along in price, and you cannot help it. I have thought these matters out after mature study and, as I told you when in Boston, I will sign no license until I see my way clear to profit by it. I may be willing to make an extra quality of machine to sell at a list price higher than theirs, provided you can prevent them from copying it and to prevent them from making a better grade of machine than they now make, and at the same time I want to make a cheaper grade of bicycles without hollow forks,

818 without adjustable saddle, without enlarged spokes, without adjustable cranks, without brake mechanism as applied by you, and with and without round contractile rubber tyre, as per class- A & B, to be sold, of course, at a price less than the grade first mentioned. I think you have not thought of my position as I now give it, and you certainly cannot fail to see the awkward place I will be in. All I could do would be to throw up license and not be free as I am now. As you say, I must not be able to dispute any right with you in regard to your so-called patents. If you cannot modify this to suit me I will not take a license, and it must be understood that when (if I should take a license) I did return my copy you must return yours, and we must stand as we do now. I ex-

pected from the first to get much better terms than you have yet offered and not to be bound up by price restrictions. You complain about amount of time I take to settle this thing. I might say it is a matter of importance to me, as whatever arrangement I finally make I shall live up to it religiously and will have it in such a shape to suit me and to be profitable to me, so I can live up to it without any loss to myself in the future. I shall for the present decide to finish what bicycles I have on hand as per your special permission, dated Jan'y 9th, '83, and I think if you look at your letter of that date and of mine Jan'y 12th, '83, you will find there is no word said as to what price I shall sell them, only that the rates of royalties are to be fixed on my visit to you, and which were fixed at that time and which I will pay you. From your letter received to-day I imagine you have misinterpreted them or have forgotten the language used.

In reference to Mr. Jeffery, I am somewhat surprised at your remarks. I have spoken to him on the matter, and he tells
819 me at my request he has discontinued the advertisement that was obnoxious to you and not entered into or thought of doing anything else detrimental to you or any other member of the bicycle trade. I again state I will take no license unless made in the form I last wrote, or else place other makers in such a position that they cannot interfere with me, and of this I must have evidence. If I do not get this, as I before stated, I will simply finish my stock, and I have sufficient trade in repairing and in the manufacture of other goods which I am making to keep me busy until I decide what further action to take. Still I am as anxious to settle it as you are, and await your further reply. I am,

Yours resp'y, &c., R. PHILIP GORMULLY.

DEFENDANT'S EXHIBIT COMPLAINANT'S LETTER, MARCH 17, '83.

BOSTON, *March* 17, 1883.

Mr. R. Philip Gormully, 228 Michigan St., Chicago, Ill.

DEAR SIR: Replying to your favor of 12th inst., just to hand, we regret that our negotiations are not brought to a close and that you do not yet seem quite to understand. You do not quite understand yet the limitations on the W. T. Co. and the St. Nich. T. Co., so let us more fully, or rather again, state it. The W. T. Co. are bound by agreement, as part of their license, not to make bicycles with metallic wheels and elastic tires larger than 42 inches, and not to make them except of certain cheap pattern, and not to sell them at higher prices than $40 for 42-inch and from that downward. In like manner the St. Nich. T. Co. are bound not to make bicycles with metallic wheels and elastic tires except from 44 to 50
820 inches, of certain cheap construction, and at not more than $60 for 50-inch and from that downward on smaller sizes.

W. T. Co.	St. N. T. Co.		P. M'f'g Co. and others.

They each have their field (the diagram shows it better than words) and we have ours, and there is an intermediate field, which we have partly occupied with our Mustang, and either shall occupy or let some licensee occupy (in that case substantially withdrawing from it ourselves) and in which there is already and will constantly be more and more a demand.

It is that intermediate field we want you to take, and you can do better and make more money in that field (excuse us for saying that after five years' exclusive attention to the velocipede business we know something about it) than you will by competing with the others directly.

Now, you seem to agree with us mostly on this, but don't see that you will be protected in the field you take. You will be protected, because we can for three years longer keep others off by our patents, and we can keep the W. T. Co. and the St. Nich. Co. off by their contracts, which restrain them from doing the things you are to do, and the conditions and terms of which any court will enjoin them to fulfill. We mean what we say and know whereof we speak, and we shall be just as careful to protect you while your license is in force and you are actually occupying the field as we are now to protect others. They cannot adopt your improvements or copy you or compete directly with you, because they not only have no license to do so but have expressly agreed not to in contracts that cannot be enforced.

821 We don't want you to go in and not make money. It will be for our interest as well as yours that you shall succeed—don't you see? Now, with four strong concerns as that would make established, with a long start in experience and facilities for manufacture and a hold on a trade already worked up for two or three years, we could control the business substantially over the whole field of American manufacture, even after the patents have expired.

Now, as you were in error in supposing that they had "unconditional licenses" and did not remember the terms, will you not look the matter over again and see it as we do? We have gone so far now that we would like to have you take a license and come permanently into the business on a fair footing with the rest of us, and if you see it differently now about accepting our terms (with a modification for the Jeffery stock, and also for what you may do hereafter for export trade, on which we should waive all restrictions as to price and allow rebate on royalties) and think we could fix things pretty quickly, our Mr. Pratt will go out to Chicago for that purpose, supposing, of course, we cannot do without.

Yours truly, ALBERT A. POPE, *Pres't.*

MAY 1ST, '3.

The Pope Man'f'g Co., Boston, Mass.

GENT'N: Yours of the 26th ultimo to hand, and in reply would say that I am prepared to make a license with you if you will somewhat conform to my ideas about the matter of discounts. You wish to class me as a maker of machines of same quality as your-

822 selves and on the same footing as importers. This is wrong.

I am to make a medium-grade machine; not of the first class; therefore I should be able to give a higher discount. I have talked with large dealers, and. they say they must have 35 per cent. as an inducement to sell them. Furthermore, I would only give this discount to large dealers or men who were likely to job them to the general dealers—that is, small men. Probably I should only give them 25 per cent. If you will agree to this that will settle matters of prices and discounts, and I am sure if you will consider you will find I am right, and that I have no desire to compete with parties here, only to make my trade effective with dealers, and if I find after some experience and my goods are introduced and appreciated that I can reduce the discount you can be sure I should do so, as it would be all clear profit. Again, I am willing to agree to present figures for royalties in view of your probable reduction of same as patents expire, which reduction, I presume, will commence with the expiration of the Lallement patent in November next, and so on to the end of the Hanlon and other patents, all of which expire in about three years, at which time my license is to expire; not to go on indefinitely by reissues or new patents unless I so desire it; and I want you to agree that if any reduction of royalties is made to any licensees for any cause whatever it shall also be reduced to me, and you shall at once notify me of such reduction. I should also want you to agree not to allow any present licensee or license any other person or persons to make same grade of bicycle you set apart for me. I should also wish to make up to 54 inch, and would agree not to give more than 25 per cent. discount on bicycles larger than 50 inch.

823 As to the special license, as we are now apparently nearing a permanent license, it would be more satisfactory to me to have it embodied in as few words as possible in permanent license, although I see no occasion for it, as our correspondence thoroughly covers it, in my opinion. I think I am now meet- you as honorably as you met me, and as you know my desires you can formulate a special permanent license in accordance therewith, leaving out all objectionable clauses that will work only one way. Make it fair and equitable, so that I can sign it without further complaint and thus end the controversy. What I particularly want to impress on you is that when the principal patents expire—in about three years or so—that we shall mutually return contracts and then stand *statu quo*, as we do now; for you to have no claim of any kind on me, and that I shall have none on you, provided we mutually fulfill our obligations.

Yours resp'y, R. PHILIP GORMULLY.

DEFENDANT'S EXHIBIT COMPLAINANT'S LETTER MAY 4, '83.

BOSTON, 4 *May*, 1883.

Mr. R. P. Gormully, 228 Michigan St., Chicago, Ill.

DEAR SIR: Your favor of 1st inst. is just to hand and noted, and from it we see that, as you say, "we are now apparently nearing a

permanent license." It will be a little more satisfactory to us if you will sign the special license sent on, as you say you are willing to, to get so much of the matter out of the way, and we will say that as you had some objection to retaining the "7th" clause in it until the other matters were settled, if you still have that objection
824 you may strike that clause out, your doing so and this consent to it being without prejudice or implication that you may do otherwise on account of striking it out.

To the other matters you refer to in your letter we are ready to consent now, and so advance a little further to meet you, with one exception. We are ready to agree to reduce royalties to you as soon as they are reduced for any one for any cause, and that we will notify you of any reduction. We will also agree to let you return the contract and stand in *statu quo*, substantially, when the three years or so patents expire. We should also agree not to license anybody else to make the same grade of bicycle set apart for you within one year from the date of your license, and not after that without previous notice to you, under that arrangement, which is substantially the same as our agreement with the Western Toy Company and the St. Nicholas Toy Company have under their licenses. We should probably not license anybody at all to make the same grade of machines. At the same time we should prefer not to make an absolute contract on that point.

As to making 52 and 54 inch machines, we should rather not put that in the license now, because we think you would not get to it right away, as you would have enough to do to get ready to make and to turn out machines up to 50 inches, and think that your experience would be like ours, probably—that on cheaper grade bicycles it is not good for the general business nor profitable on the special business to make them so large sizes. We stopped making the Mustangs above 50 inches and then stopped making them considerably below that. If afterwards, when we saw the character of your machines and you saw exactly what you wanted to do on larger sizes, it seemed that you could do so without injury
825 to the general business, there would be no difficulty in our agreeing about it.

Now, as to the matter of discounts. We cannot agree to it as you state it in your letter, and we do not think you would want to after 15 minutes' conversation. We would consent to some modification of it perhaps, but see what a concession we have already made. We allow you to give 5 per ct. greater discount than we ever give to our largest agents or that we allow our other licensees to give, except the St. Nicholas and Western Toy Companies.

We have said before that our experience teaches us, having had considerable of it on other lines of goods before we went into bicycles, that large discounts are given away or divided by agents and dealers and the business disorganized; but this we can do and offer to do, which perhaps you did not see the force of: we will agree that you may sell to some of our regular licensees at any discounts you please, provided the retail prices are preserved and the discounts to agents.

Now, we think we should be amongst your best customers. If you turn out the machines you think you are going to and can supply them to us at the discounts you intimate we should probably stop making Mustangs altogether and sell your goods. The Cunningham Co. is one of our chief licensees, and we think it probable that they would handle the line of goods which you will make (although they do not the cheaper goods of the toy companies) to a large extent and you could sell to them at the larger discounts, with agreements for keeping up discounts to agents and retail prices.

826 If there is any apparent way in which we can aid you to get them to furnish an outlet for your goods to your advantage we will gladly do so. Under the same arrangement you could supply to the St. Nicholas or Western Toy Companies at any discount, and they or their customers would be likely to furnish additional facilities for working off your goods either with their own or in addition to your own; so that here are four dealers right off to whom you could allow 35 per ct. discount under the license proposed and who would probably dispose of all the goods you would want to supply at so large a discount.

So we think that we are now substantially close upon an agreement which will be mutually satisfactory and advantageous.

If on reconsideration of the discount matter you think we can agree upon the modified draft of license which we should naturally draw under this letter we will do so and send it out to you.

It will occur to you now that it will continue to be true that what is for your interest is for ours, since the only good of your taking a license, as far as we are concerned, is that the license shall be profitable to both, and also that as occasion arises it will be either to make subsequent agreements which shall help to carry out things not provided for before the occasions arise.

Trusting that this will bring matters to a speedy conclusion, awaiting your reply, we are

Yours very truly, THE POPE M'F'G CO.,
By C. E. PRATT, *Att'y.*

827 JUNE 23, '4.

The Pope M'f'g Co., Boston, Mass.

GENTS: Yours of the 20th of June to hand, and in reply would say am glad to find you have notified parties making and selling out of their grade, and should like to see the circular you spoke of in a previous letter. It might be well to send a careful letter to the trade generally. It might stop any feeling that may be aroused. You also say that I have not kept my contract. Now, I might say it took me some time to make my contract; but, as I told you when I did, I made it in good faith and after mature thought and meant to keep that faith. I cannot see how I have failed, but I will explain and then you how the others have failed. You told me the other parties could only make machines at a certain price—their then list price—and I mut not list less than 20% higher than theirs. I have done so (but they have increased their price). Again,

the contract reads, "not greater than 80 per cent. of present list of Standard Columbia of the same or nearest sizes or styles of finish." You have three styles of finish. You did not limit me to number of styles of finish, so I adopted or nearly so your three styles, and prices are within 80 per cent. on all styles, so wherein have I erred? Now I have come to the time to increase the size. You promised me to do it. I think it is a proper time now. I make a better machine, have now ample facilities, and have spent a large amount of money, and should have an advantage of size over cheaper makers. Again, I think it will pay you as well as myself. As the expiration of patents is so near it will benefit you to get royalties. I have a large number of enquiries for machines up to 58-inch. The people say they cannot afford to pay your price, but would buy if
828 they were somewhat cheaper, and also to stop the sale of so many imported machines, of which a number are sold, and thus keep the busines- right here and be easier for you to control. I have plenty of room and facilities for doing a much larger business than I am, and this increase of size I do not think would affect you but greatly benefit me, as I need to do more business to put my factory on a paying basis.

I notice you have not sent acknowledgment for royalties sent for the last two or three months. Please do so.

Waiting your favorable reply, I remain

Yours resp'y, R. P. GORMULLY.

OCTOBER 20, 1884.

The Pope Manufacturing Co., Boston, Mass.:

Replying to yours of the 4th inst. containing draft of license for 52-inch wheels and larger (have been extremely busy or would have alluded to same before), I have read over same and cannot quite understand the full import of it and why you should wish to extend time of license for 10 years longer when I can see no possibility of you rendering me any protection after the spring of 1886, as all necessary patents expire at that time, and it would simply leave me crippled and all the rest of the world free. There seems to me to be a lot of unnecessary verbiage, and would suggest that you simply make a memorandum to present license granting me the right to increase size of front wheels to 52 inches and upwards of same style and proportionate price as the Ideal machine now manufactured by me. This is all that seems to me necessary; and as we have had satisfactory business arrangements so far, and by
829 simply modifying present license as above I think our business can continue satisfactory in the future, although from appearances it will be more difficult, as I see by late publications that the Overman Co. are going to bring out a line of bicycles in March next, and also other parties are preparing to make wheels that will compete actively with present makers.

I should like to know the style of their goods, and I will endeavor to meet them in a proper manner if they come near my class of goods.

Have had a visit from the Brown quadricycle people, and they

wish me to make machines of similar grade to Ideal, sizes 38, 42, and 46, to sell at a retail price of $75.00, $85.00, and $100.00 each, respectively. Should be glad to have an opinion from you as to the probable sale of such machines, also the number that might be sold, and if you think they would be favorably received by the public, etc. I find I can profitably add to my list of manufactures, and thought of making either this or a tricycle. Which do you think would be the best?

Yours resp'y, R. P. GORMULLY.

OCTOBER 29TH, '4.

The Pope Manuf'g Co., Boston, Mass.

GENTLEMEN: Yours of the 24th inst. to hand, and in reply would say that the time or date clause is not the only objection I have to form of license sent. I have inclosed it with pencil erasures and additions; such alterations, I think, would be correct. In my last letter I asked you to simply extend the present contract I have with you so as to enable me to make larger sizes—making in it
830 same stipulations as to price, &c. Why not do that? You will notice in first clause I have struck out the words "and without hollow forks and ball bearings." I wish to make them with ball bearings at an extra cost, same as I now do the Ideal, and I might make them with hollow forks, as I wish to complete with the cheap English machines which are now largely imported, and also in the making of racing machines, and should not wish to be debarred. Then you will also find the license, as you framed it, confines me to retail trade in Chicago. I have erased at various places and interlined so as to conform with my present license; also portion relating to Wheelman—I think it beyond the province and arbitrary. I have certainly done a goodly share of advertising and will agree to do so, but must be privileged to select my own journals and fields. I also object to your claims in patent 197,289, Peters ball bearings, as I think it would invalidate my claim to my globular bearing, as now applied to the Ideal. I want to act in a fair, honest, and upright manner in this matter, and expect you to be so equally with me. This may have escaped your notice, but it would not be fair for me to relinquish any claims I might have. I still think there is a lot of unnecessary verbiage, and cannot quite see the drift of it, and certainly if of no use why not just add a memorandum to present license and thus affect the arrangement without this new form? I have also made discounts, etc., conform to present license so as to keep absolutely within the field I now occupy, and wish to make a machine to be of exactly the same range of price and give dealers a chance to make a fair profit and sell them instead of the cheaper English machine. I enclose you a card and price-list of John Shire, Detroit, Mich. I find this man is
831 interfering somewhat with my trade. He sold eleven (11) machines in one town in Michigan where I only sold two. Has this man a license? Waiting your reply,

I am, resp'y, &c., R. PHILIP GORMULLY.

NOVEMBER 12TH, '4.

Pope Man'f'g Co., Boston, Mass.

GENTLEMEN: Yours of the 4th to hand. I understand, then, you will give me a license to manufacture 52 in. and upwards with solid forks to sell to the trade as I now sell, giving a discount of 25% to larger dealers, to whom I now give 35% on the Ideal, and 20% to smaller dealers, and I can attach ball bearings on said machines at an extra price and on same principle as I do now on the Ideal.

Respecting the advertising, I think it is arbitrary. I have steadily advertised in the Wheelman, paying them $180.00 (one hundred and eighty dollars) per year, and am willing to advertise more in that paper next year, as it will be of more benefit to me in larger sizes than u pon what I am now making. I have not had their advertising rates lately, so cannot tell what it would amount to.

This license is to terminate, if I wish so, on the 1st of March of 1886 or sooner, and you should agree not to license any others to make same grade of machines during the existence of my license, and should it occur that some parties should make them and you should fail to protect me, then my license should be null and void from all obligations and let me free to be able to compete with them.

I enclose you a price-list showing that I am suffering from
832 competition now. This machine, I believe, is made by St. Nicholas at a price below mine, and I am creditably informed that they will shortly bring out all of the larger sizes with hollow forks and ball bearings.

I should prefer to have patent 197,289 not included in license, as it might interfere with my patent.

I think this is reaching your terms pretty nearly, and think you should meet me a little in my wishes, and if satisfactory please send license in duplicate signed and I will return one signed.

You should also agree to rebate half royalties and leave prices open for export trade, as that will give me a chance for outside business.

I am yours truly, &c.,

R. PHILIP GORMULLY.

NOV. 28TH, '4.

The Pope M'f'g Co., Boston, Mass.

GENT'N: Your several letters to hand. Respecting returns I was late in sending them in on ac. of the 1st of the present month being the end of my business year. I had stock taken, and so forth, which kept my clerk so busy that some few regular matters were delayed somewhat. I now enclose a statement showing ac. and enclose a cheque for amount of same. Until just lately the ac. has been on the other side, and I do not think I pressed for payment, and was not on that ac. particular about sending money, as the supposition was you would send me orders for holding trade which would likely balance again. Referring to error of having returned last ma-

chines sent to you as patent tires, the mistake occurred on ac. of having first gotten out your order with that tire, and at your wish changed them for round tires, and book-keeper had failed to make the change. Have allowed it to you in
833 present statement. Your remark about circular sent you being an old matter, I can assure you that they were published this October and are now being distributed. In matter of license for larger sizes, you can make out license, to terminate as you agreed, in 1886 (1st of March). As to your not granting other parties a license to make same or similar machines for one year, I am not so particular about its being stipulated in license, if you act as you have done in the past, but I should like it so understood, as I am to be at considerable expense, and should not wish to have competition for some time, until I get it on a paying basis. As to advertising, I agree with you that the Wheelman is a good medium and should be supported, and I will agree to continuously advertise with them, as I have done, and more, if terms are suitable, but, like you in other matters, would prefer not to have it stipulated in license. Again, referring to patent 197,289, I should prefer that should not be included, as I have taken advice on that matter, and am advised it will affect what claims I have on globular bearing, &c., and as you said in a former letter you did not wish me to relinquish any claims I may have, then I think, in justice, you should make it that way. I am sure I have shown every disposition in the past to act right with you, and when I make an agreement I expect to fully live up to it, and think you should meet me a little in some of my views and give me a chance to make some money out of the business. I have not made any yet directly, but expect with this new trade to be able in the next year to realize something for my capital and labor.

Waiting your reply with license, I remain, yours resp'y,

R. P. GORMULLY.

834 I see by a recent issue of Boston Journal of Commerce that the Overman Co. having ordered 100 machines to be made by the Ames M'f. Co. of Chicopee. Has this any significance?

DEFENDANT'S EXHIBIT PRATT-PETERS 1882 LETTER.

BOSTON, 14 *October*, 1882.

Mr. Orrin E. Peters, cor. Broadway & Public Square, Lancaster, O.

DEAR SIR: Your favor of 11th inst. is duly to hand and noted, and I have conferred with my client as to its contents. The sum asked is larger than he wished to pay or thought he could afford to pay for the purpose for which he wished to use it; but has finally instructed me to accept your offer of the entire interest at three hundred dollars ($300), which I do.

I enclose herewith the simplest form of assignment, which you may have duly signed and witnessed; and on receipt of it, with the original letters patent, I will immediately forward my check or draft

for the amount, or you may send it to me by express C. O. D., if you prefer.

Awaiting your reply, I am, yours truly,

CHARLES E. PRATT.

DEFENDANT'S EXHIBIT COMPLAINANT'S LETTER, NOVEMBER 4, '84.

BOSTON, *November 4th*, 1884.

R. Philip Gormully, 228 Michigan street, Chicago, Ill.

DEAR SIR: Yours of the 29th ult. is just at hand and noted.
835 You ask if John Shire has a license; he has, and we have not been informed of his travelling outside of it.

We cannot simply extend your present contract as you suggest, because that will not be satisfactory to us and will not secure our interests. We cannot give you a license to make bicycles with hollow forks and ball bearings, etc., to compete with the English machines in the market nor to make racing machines. As to the clause confining you to retail trade this, we believe, was explained to you. At any rate, it is understood that all our licenses are granted in that form. They afterwards consent to the price-list and where agents are allowed to sell at a discount, the discount that should be allowed, and the parties to whom it should be allowed. It was, as we understood, agreed that you should sell to agents and the trade, but not at the large discounts. We cannot consent to your selling to the trade and the dealers in our own and other makes of bicycles at thirty-five per cent. on the larger sizes. We would not give anybody a license to do that, not only because it would injure our own trade, but because it would injure everybody's trade. You are asking now for a license to make large sizes of bicycles, which would cause you to compete with us and our licensees. As twenty per cent. is the maximum discount that they are allowed to give, we cannot allow you to give any larger one on these larger sizes.

You remark in regard to the clause relating to advertising that it is beyond our province and arbitrary. Perhaps it is from your point of view, but it isn't from ours—first, because if we grant a license at all we have a right to name the terms upon which we grant it. In the second place, the Wheelman was founded for the express benefit of the bicycling interests, including, among
836 other things, the promotion of the trade in bicycles and tricycles and their use by the general public, and a great many thousand dollars of our money went into it. The present magazine, "Outing," is not owned by this company, but it is doing more good to help along the interest in bicycles and tricycles by the general public outside of those reached by bicycle papers than any other publication in this country, and pays the best as an advertising medium. It was established to be supported, to the extent of advertisements, by all the trade. We take and pay for at their regular rates, as you see, fully our proportion of advertising space, but we notice that the others in the trade are not doing so. In one sense it is better for us, as it leaves our advertisement with less competition.

In another sense it is not for our interest, because we are informed that the magazine instead of making money is losing it, and it is not for our interest and the interest of everybody in the trade that they should either be obliged to discontinue or else to reduce the amount of money and space it devotes to the bicycle and tricycle business and literature. It has had to borrow money and is borrowing money of us. Now, when we grant a license which allows anybody to compete with us it is neither arbitrary nor beyond our province to ask them to contribute something toward the support of that magazine.

You misread the license, probably, as to the Peters patent, as we do not ask you to admit in that license that the ball bearings on the "Ideal" infringe that patent. As drawn out, it did ask you to admit the validity of that patent and the scope of it as covering ball bearings with means for lateral adjustment. We would not ask you to relinquish any claim which you have in any patent.

837 Your criticism that the draft of license contains "unnecessary verbiage" is not only needlessly repeated, but is an unnecessary fling at us, since if it were not necessary from our point of view it would not be there.

Now, we have explained that we cannot make a memorandum to the present license granting what you ask without you take a new license, and we positively decline to do so. If what you say toward the end of this letter and have said in previous letters is correct and all you want, we are ready to grant you a new license which will give it to you on the terms which were included in the draft we sent you. If we license you at all, it must be upon these terms; but if you insist upon the requisitions in this your last letter and in pencil on the draft of license, we must decline.

Yours truly, THE POPE M'F'G CO.,
By CHARLES E. PRATT, *Attorney.*

DEFENDANT'S EXHIBIT COMPLAINANT'S LETTER, NOVEMBER 20TH, 1884.

BOSTON, *November 20th*, 1884.

R. P. Gormully, No. 228 Michigan street, Chicago, Ill.

DEAR SIR: Replying more fully to your letter of the 12th, we have to say that we should not be willing to stipulate in the license positively not to license any others to make similar grades of machines during the existence of your license, although it would be our plan, as it has been in the past, not to do so, a policy which we are pursuing still with reference to the former license, although the time to which it was limited has long since expired. We

838 would agree to rebate one-half royalties on export goods for use in foreign countries, as before. As to the other matters referred to we still feel it necessary to adhere to our former terms, though we still prefer not to give you license to make the larger sizes. The slip which you enclosed regarding the improved Wilkinson bicycle is from an old circular, and there is nothing new in

it, and there is nothing about there going into the larger sizes with hollow forks and ball bearings which is worth taking any notice of at all.

Yours truly,

THE POPE M'F'G CO.
CHARLES E. PRATT, *Att'y.*

DEFENDANT'S EXHIBIT COMPLAINANT'S LETTERS OF NOVEMBER 23, 1883, AND DECEMBER 7, 1883.

BOSTON, 23 *Nov.*, 1883.

Mr. R. P. Gormully, 228 Michigan St., Chicago, Ill.

DEAR SIR: We have your favor of 19th inst. and note its contents. We are certainly surprised that you are "astonished," and we are surprised and sorry that you seem to take the view you do in regard to the matter of royalties and the cenversations we have had before. We think our position is right, however, and perfectly consistent with all that has been agreed upon.

Your recollection must be at fault in regard to what Mr. Pratt said when in Chicago, as he did not promise or say there would be a reduction of royalties this month, and he had no authority to promise it, and if he had had authority and had promised it it wouldn't have been like you or like him not to have had it in writing; and when we look at the written contracts and letters and memoranda, as well as to our recollection of the matter, we
839 find that, although you desire a reduction and sought to obtain a promise of reduction we constantly declined to make any such promise or to say that the royalties would be reduced; but, as you have already quoted from the contract, we said that whenever rates were reduced to others on bicycles of similar grade you should have a similar reduction.

Now, we are under no obligation to make any reduction of the royalties, and you will permit us to remind you that in your negotiation for the license you left out of account particularly, as you said in your conversation with us, the Lallement patent because that would so soon expire.

We don't care to discuss the proportionate importance of the different patents with you, but simply to say that we do not assent to your illustration by the sale of commodities nor to your estimate of the proportionate value of the Lallement patent. On the wooden-wheel machines, which are of very low price and made under fewer patents, the expiration of one patent makes more percentage of difference than it does on the larger sizes.

We may mention, by the way, that we have had within a fortnight from two manufacturing concerns applications for license to make bicycles pretty near to your size and construction, which we have refused, of course, under our agreement with you.

We enclose herewith a leaf from the Bicycling World of this date, in which was published, on page 29, a communication purporting to be from T. B. Jeffery. You recollect that when you were here last spring and we called your attention to some disparaging state-

ments of Mr. Jeffery's in print and also of Mr. Miller's you said they were published without your knowledge, and you
840 would see that they were stopped. They were stopped. Mr. Jeffery is still in your employ, as we understand it, and therefore we think this must have been sent to the World without your knowledge. It is unnecessary, probably, for us to make any suggestions in the matter. Your own interest would incite you to prevent such communications as that, intended to stir up other parties to make machines in competition with you, when you have practically exclusive license without appealing to any interest of ours.

Yours very truly, THE POPE M'F'G CO.,
By CHARLES E. PRATT, *Att'y.*

BOSTON, *December 7th*, 1883.

Mr. R. P. Gormully, 228 Michigan St., Chicago, Ill.

DEAR SIR: Your favor of the 3rd inst. is just to hand and noted, in which we are pleased to note what you say as to your ample preparations for next season's business, which will undoubtedly be good. It has generally been the case that makers and dealers here have been too timid to have a sufficient stock of machines in stock ready to meet the demand in the trade.

We regret that you should find cause to feel uneasiness, especially on account of what the St. Nicholas people say they are going to do. We have no hesitation, however, in assuring you that they will do neither of several things—they will not make your grade of bicycles, nor a better grade, nor will they disturb your prices.

It makes us smile to have you ask, "What are you going to do about it?" Why, dear sir, although we were a little slow and kindly with them for several months from reluctance to
841 being drawn into permanent hostility, yet when we did go ahead with the suit our counsel, as soon as the court would hear such cases, obtained an order of the court that the defendants should comply with the terms of the licenses, and ordered that an injunction issue within ten days unless they made returns of the machines sold and payment of the royalties within ten days; accordingly they made returns; but on the face of the returns there was a doubt as to the amount to be paid under one or two of the agreements, so they got a modification of the order as to time for making the payments, and Judge Blodgett, having been engaged in the district court with jury trials, etc., had not, at our last advices from Coburn & Thacher, heard any equity matters yet, so that the matter of making the payments has hung a little. What shall we do about it? Why, we shall, if they don't comply with their contracts with us, keep them in court and under injunctions and under expenses until they conform to law and contract or until the whole practice of the court is changed.

You don't quite answer our letter with respect to the Jeffery matter. We made Mr. Jeffery a fair proposition for a compromise in his interest, and are ready to abide by it; but we are not ready to make any more concessions to Mr. Jeffery. We don't feel called

upon to do anything now ourselves since it is left entirely in the hands of our counsel.

We understand Mr. Jeffery to be an employé of yours. If he isn't, we would like to know it. If he is, then you are responsible for him as you are for any other agent and employé of yours, and it is neither according to the letter nor the spirit of our agreements with you that he should be constantly endeavoring, as he does, to impair the public respect for our patent rights, which you
842 are equally interested with us in having maintained. We have within three or four weeks rejected two applications from responsible manufacturing concerns to make the same or similar line of machines as you are licensed to make. Now, if we are to hold the fort so as to protect you in a practically exclusive license, it is the least you can do to co-operate with us.

Why can't you make Jeffery say (and act accordingly) that there is no such thing as absolute truth in regard to titles, either to patents or real estate or anything else. The practical value of any claim of title is that the claim is maintained under the laws, and so long as our title to the inventions covered by our patents is actually sustained under the laws we and our licensees have the full benefit of it, no matter what the private opinions of individuals may be in regard to it.

So far as we are informed, and we keep a pretty good lookout across the country, there is no infringement of our patents now. We have brought probably from fifteen to twenty suits, and in none of them have we ever been defeated or had any decision against us, except in the Ohio one, and in that the decision was not filed, and was, as we have before satisfied you and others, obtained in a peculiar way and against the law of this country, and proceedings have been taken to set it aside.

The only other branch of litigation that affects these rights is that of enforcing our contracts with licensees. This we have not been obliged to resort to the courts to enforce, except in the instances of Mr. Fairfield, Mr. Jeffery, and the St. Nicholas Toy Co., though we came very near it with the Western Toy Co. Those are the only instances, and we believe you understand how much success they have resulted in to the parties who tried not to keep their contracts.

843 From this view of things we have no alarm about the future, and we don't think you have any reason for any serious apprehensions such as you intimate in your last letter; on the contrary, we think you may go on in the method you propose with a feeling of security and that you will do a good business in the future.

Yours truly,

THE POPE M'F'G CO.,
By CHARLES E. PRATT, *Att'y.*

DEFENDANT'S EXHIBIT COMPLAINANT'S LETTER, OCTOBER 24, 1884.

BOSTON, *October* 24, 1884.

Mr. R. P. Gormully, 222 North Franklin street, Chicago.

DEAR SIR: We have your favors of the 20th and 21st inst., and in reply to the first we have to say:

We suppose your objection to the ten-year matter arises from the words used at the end of the fifth line of the second page, "21st day of November, A. D. 1894," which, if objectionable to you, you may erase and interline in place of them the words "first day of April, A. D. 1886," and that will relieve this objection. You should not be so much afraid of our wishing or trying to cripple you and leave the rest of the world free. Some day you will get that idea out of your mind. With the change in the license above noted that is the way we are willing to give it, and if there is unnecessary verbiage, why let it go as our fault.

The matter of the Overman Company making bicycles for sale in March next—are you so child-like as to believe everything that is published? The Overman Wheel Company has not yet made a bicycle. We have two suits against them under our pat-
844 ents, and we are preparing cases for preliminary injunctions. They have simply caused that to be published, partly as an injury to our business and partly because they believe that they can do so. We do not believe that they can do so without license, and we take no anxiety about it. They have also caused to be published that they have brought a suit for $50,000 against us under the Bown patent. This is absurd for several reasons. In the first place, they do not own the Bown pat.; in the second place, we have never infringed it, and, in the third place, they have not brought any suit whatever. The Brown Quadricycle Co. has a license from us to make their quadricycles, and they will have no difficulty in obtaining our consent to your making them for them if they wish it. You ask for our opinion as to the probable sale of small machines of that variety, on which we have not yet made any opinion and cannot at present state any. Their machine is somewhat experimental in its present form. We presume they will improve it and that it will sell to a considerable extent. As to your making a tricycle, it seems to us that you have no license for doing so and that you do not want it. There are enough in that business at present, and you would simply be competing, as the Western Toy Company is, by bringing out a large line of cheap tricycles.

As to your second note, asking us our objections to the flattened tire, we have to say that they are two. One is that the flattened tires are not as good for the purposes to which they are put, and the other is that they are not so salable, the customers preferring the regular round tire.

Yours very truly,

THE POPE M'F'G CO.
CHAS. E. PRATT, *Att'y*,
Per H. H. F.

845 DEFENDANT'S EXHIBIT CONSIDERATION PETERS PATENT.

LANCASTER, OHIO, *Jan'y 13th*, 1886.

Gormully & Jeffery.

GENTS: Yr's rec'd. The receipt was signed for transfer of papers, &c., on Oct. 23, '82, by Chas. E. Pratt, attorney for E. R. Drew, Boston, Mass.; the date of the transfer was probably dated about Oct. 18, '82; consideration, $300.00; sorry we disposed of it. G. M. Peters, pres't King's Great Western Powder Co., Xenia, Ohio, was the inventor of most of it; glad to hear from you at any time.

Y'r's truly, O. E. PETERS.

DEFENDANT'S EXHIBIT NOTICE INCORPORATION OF DEFENDANT CORPORATION.

To R. Philip Gormully, Thomas B. Jeffery, Michael J. Naghten, Edwin F. Bayley, and James A. Miller:

You are hereby notified that the capital stock of "Gormully and Jeffery Manufacturing Company" has been fully subscribed, and that a meeting of the subscribers of such stock will be held at the office of Bayley and Waldo, room 17, Borden block, in Chicago, Illinois, on the nineteenth day of October, A. D. 1886, at two o'clock p. m., for the purpose of electing a board of directors for said company and for the transaction of such other business as may be deemed necessary.

(Signed) R. PHILIP GORMULLY,
THOMAS B. JEFFERY,
MICHAEL J. NAGHTEN,
JAMES A. MILLER,
EDWIN F. BAILEY,
Commissioners.

846 DEFENDANT'S EXHIBITS 1884–'5 & '6 BALL-BEARING ORDERS.

MAY 9TH, 1884.

Dated Boston, 9.

To R. P. Gormully, 228, Mich.:

Two dens with ball bearings and straight handle bars, A. W. Childs, Brattleboro', Vt.

THE POPE M'F'G CO.

BOSTON, MASS., *May* 2, 1884.

Mr. R. P. Gormully, Chicago, Ill.

DEAR SIR: Please send by freight, as soon as possible, to Weed Sew'g Mach. Co., Hartford, Conn.—

1 42-in. full nick'd Ideal ball bearings,
4 extra front wheel spokes } for same,
2 " rear " " }
and charge same to ac. of
Yours resp'y, THE POPE M'F'G CO.,
JOY.

BOSTON, MASS., *May* 9, 1884.

Mr. R. P. Gormully, Chicago, Ill.

DEAR SIR: We have just wired you to ship by express to A. W. Childs, Brattleboro', Vt., 2 46-in. Ideals, Standard finish, with ball bearings and straight handle bars.

Please hurry, if possible, and charge same to ac. of
Yours resp'y, THE POPE M'F'G CO.,
JOY.

847 BOSTON, MASS., *May* 27, 1884.

Mess. Gormully & Jeffery, Chicago, Ill.

GENTLEMEN: We have just telegraphed you to ship by American Express to A. W. Childs, Brattleboro', Vt.—
1 42-in. Ideal, Standard finish, with ball bearings.
1 46 " " " "
Charge same to ac. of
Yours resp'y, THE POPE M'F'G CO.,
JOY.

CHICAGO, 7–14, 1885.

Mess. Gormully & Jeffers.

GENTLEMEN: Please send us at once (machine is sold and promised by noon of the 15th) 1 54 American Challenge Std., with B. bgs. front & rear, drop handles.
1 42 Ideal Standard.
Please try and have the A. C. here by noon at latest and ob'ge
Yours truly, W. M. DURELL.,
B.

BOSTON, MASS., *Nov.* 22, 1886.

Mess. Gormully & Jeffery, Chicago, Ill.

GENTLEMEN: Please ship by freight, released, to A. R. Whitmire, Goldville, S. C., 1 42-inch Ideal, Standard finish, with ball bearings to front wheel and backbone attached, ready for riding.
Charge same to ac. of
Yours res'p'y, THE POPE M'F'G CO.,
JOY.

848 DEFENDANT'S EXHIBIT JEFFERY INJUNCTION.

CIRCUIT COURT OF THE UNITED STATES OF AMERICA, *Northern District of Illinois*, } ss:

The United States of America to Thomas B. Jeffery and to your counsellors, attorneys, solicitors, trustees, and agents and to each and every of them, Greeting:

Whereas it hath been represented to the judges of our circuit court of the United States for the northern district of Illinois, in chancery sitting, on the part of The Pope Manufacturing Company, complainant, in its certain bill of complaint exhibited in our said circuit court, on the chancery side thereof, before the judges of said court, against you, the said Thomas B. Jeffery, to be relieved touching the matters complained of, in which said bill it is stated, among other things, that you are combining and confederating with others to injure the complainant touching the matters set forth in the said bill, and that your actings and doings in the premises are contrary to equity and good conscience, and it being ordered that a writ of injunction issue out of said court upon said bill enjoining and restraining you and each of you as prayed for in said bill, we, therefore, in consideration thereof and of the particular matters in said bill set forth, do strictly command you, the said Thomas B. Jeffery, your counsellors, attorneys, solicitors, trustees, and agents and each and every of you, that you do absolutely desist and refrain from manufacturing and selling any bicycles, tricycles, or velocipedes except in accordance with the terms of the license referred to in said complainant's bill of complaint.

849 Hereof fail not under the penalty of what the law directs.

To the marshal of the northern district of Illinois to execute and return in due form of law.

Witness the Hon. Morrison R. Waite, Chief Justice of the Supreme Court of the United States of America, at Chicago, in said [SEAL.] district, this 12th day of December, in the year of our Lord one thousand eight hundred and eighty-five, and of our Independence the one hundred and tenth year.

WM. H. BRADLEY, *Clerk.*

DEFENDANT'S EXHIBIT JEFFERY LICENSE.

This agreement, made by and between the Pope Manufacturing Company, a corporation established under and by virtue of the laws of the State of Connecticut, having a place of business in Boston, Commonwealth of Massachusetts, party of the first part, and Thomas B. Jeffery, of Chicago, State of Illinois, party of the second part, witnesseth:

That whereas said party of the first part own and control the following letters patent of the United States and inventions therein set forth and described, viz:

850 No. 3319, dated March 2, 1869, reissue, S. W. Smith;
No. 39349, " July 28, 1863, P. W. Mackenzie;
No. 41310, dated Jan'y 19, 1864, " "
No. 7818, " July 31, 1877, reissue, Montpelier M'f'g Co.;
No. 46705, " March 7, 1865, Harvey A. Reynolds;
No. 54207, " April 24, 1866, " " "
No. 80425, " July 28, 1868, " " "
No. 87999, " March 16, 1869, Calvin Witty;
No. 59915, " Nov. 20, 1866, Pierre Rallement;
No. 7972, " Nov. 29, 1877, reissue, Richardson & McKee;
No. 8252, " May 28, 1878, Harvey A. Reynolds;

And whereas said party of the second part is desirous of securing license and authority to work under said patents and to make and sell the inventions and improvements therein set forth and described:

Now, therefore, said parties have agreed to the following terms and provisions—that is to say:

First. The party of the first part agrees to license, and does hereby license and empower, said party of the second part, subject to the conditions and provisions hereinafter named, to make, use, and sell to the full end of the term for which each of said letters patent were granted velocipedes and bicycles whose wheels are without rubber tires and do not exceed (42) forty-two inches embodying in their construction or mode of operation the inventions and improvements shown and described in each, all, or either of said letters patent.

Second. The party of the second part hereby agrees to make full and true returns in writing to the said party of the first part on or before the 10th day of each calendar month in each year of all velocipedes and bicycles containing said improvements so manufactured by the party of the second part during the month preceding and the name or names of any and all purchasers of the
851 same and to pay the royalty or license fee accruing thereon on or before said tenth day of each of said months.

Third. The said party of the second part hereby agrees to keep full, true, and correct books of account, open at all reasonable times to the inspection of said party of the first part, in which shall be entered and set down all said velocipedes and bicycles manufactured or sold by them, and mark each machine sold patented.

Fourth. The said party of the second part hereby agrees to pay to said party of the first part the sum of (40) forty cents on all machines of (32) thirty-two-inch wheel or under and (1) one dollar on all over that size and not exceeding (42) forty-two inches as a license fee or royalty upon each and every velocipede or bicycle so manufactured or sold by said party of the second part containing the improvements set forth and described in said letters patent or either of them.

Fifth. The party of the second — also hereby further agrees that they will not make or sell any velocipedes or bicycles other than those having wheels without rubber tires and not of greater diameter than (42) forty-two inches, nor in any manner, directly or

853

J. SHIRE.

Velocipede.

No. 216,231. **Patented** June 3, 1879.

No. 207. Pope Mfg. Co. } p. 853
G. & J. Mfg. Co. }

Fig. 1

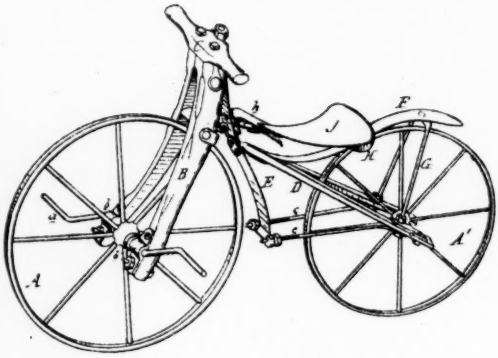
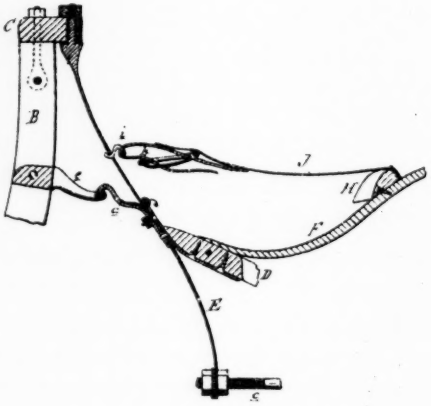


Fig. 2



Attest:
A. Barthel
Charles J. Kent

Inventor:
John Shire
By Atty
Thos. S. Sprague

indirectly, violate or infringe upon said letters patent or either of them, nor dispute or contest the validity of the same or the title thereto of the party of the first part or their assigns, but will aid and morally assist said party of the first part in preventing infringements upon the same.

Sixth. In case said party of the second part shall violate any of the provisions, covenants, or promises herein contained on their part to be kept and performed the party of the first part may
852 terminate this license by notifying the said party of the second part in writing that their said license has been revoked.

In witness whereof said parties have hereunto set their hands and seals and to another instrument of like tenor and date 16th day of March, 1880.

THE POPE M'F'G CO.,
ALBERT A. POPE, *Pres't.* [SEAL.]
THOS. B. JEFFERY. [SEAL.]

854 UNITED STATES PATENT OFFICE.

JOHN SHIRE, of Detroit, Michigan.

Improvement in Velocipedes.

Specification forming part of Letters Patent No. 216,231, dated June 3, 1879; application filed May 6, 1879.

To all whom it may concern:

Be it known that I, John Shire, of Detroit, in the county of Wayne and State of Michigan, have invented an improvement in velocipedes, of which the following is a specification.

The nature of my invention relates to an improvement in the construction of that class of velocipedes known as "bicycles;" and the invention consists, first, in the peculiar construction and application of the spring; second, in the construction and adaptation of the seat, so that it is brought into close proximity to the driving-wheel, thus allowing a wheel of greater diameter to be used than when constructed in the ordinary manner; and in the peculiar construction and arrangement of the various parts, all as more fully hereinafter described.

(Here follows diagram marked p. 853.)

Figure 1 is a perspective view of my improved velocipede. Fig. 2 is a sectional view through the standard, seat, and spring, enlarged.

In the accompanying drawings, which form a part of this specification, A represents the forward or driving wheel, mounted upon a double-crank shaft, *a*, journaled in bearings *b* at or near the lower end of the forked standard B, across the top of which is secured the head or handle C.

The rear wheel, A′, is suitably journaled between the ends of the bifurcated frame D. The forward end of this frame or standard is rigidly secured to the metallic spring E at or about the center thereof, the lower end of said spring being connected to the frame or standard D by means of the brace-rods *c*.

The upper end of the spring is pivoted in any proper manner to the head of the standard B.

The spring is still further connected to the forward standard by means of the hook *d*, which engages with an eye, *e*, secured to the standard, and projecting rearward therefrom for that purpose.

Secured to the top of the frame D, and extending rearward over the wheel A′, is a fender, F, the rear end of which rests upon and is secured to a forked frame or standard, G, which rises from the rear end of the frame D. To the top of this fender F is rigidly secured a seat-block, H, to which is secured one end of the adjustable hammock-seat J, the opposite end of which is provided with a strap and buckle, *h*, to engage with a loop, *i*, projecting from the rear face of the spring.

By this construction, it will readily be seen that the elasticity is derived entirely from the metallic spring E, and that the torsional strain upon the rear frame incident to the ordinary manner of construction is entirely avoided, while at the same time a much more elastic and yielding support or seat for the operator is obtained.

It will further be seen that by the use of an adjustable hammock-seat, as described, the seat may be brought into closer proximity to the driving-wheel than when constructed in the ordinary manner, which will admit the use of a driving-wheel of greater diameter.

What I claim as my invention is—

1. In a velocipede, the combination, with the driving-wheel standard B and seat-frame D, of the leaf-spring E, connecting the said standard and frame, substantially as described and shown.

2. In a velocipede, the adjustable hammock-seat J, substantially as set forth.

3. The combination, with the forward standard driving-wheel of a velocipede, of the spring E, standard D, and suitable braces *c*, substantially as described.

4. A velocipede consisting of the driving-wheel A, standard B, head C, spring E, pivoted to the head of the standard B, and connecting said standard with the frame D, wheel A′, hammock-seat J, adjustably secured to the spring E and to the block H, fender F, resting upon the standards G, and the braces *c*, constructed, arranged, and operating substantially as and for the purposes set forth.

JOHN SHIRE.

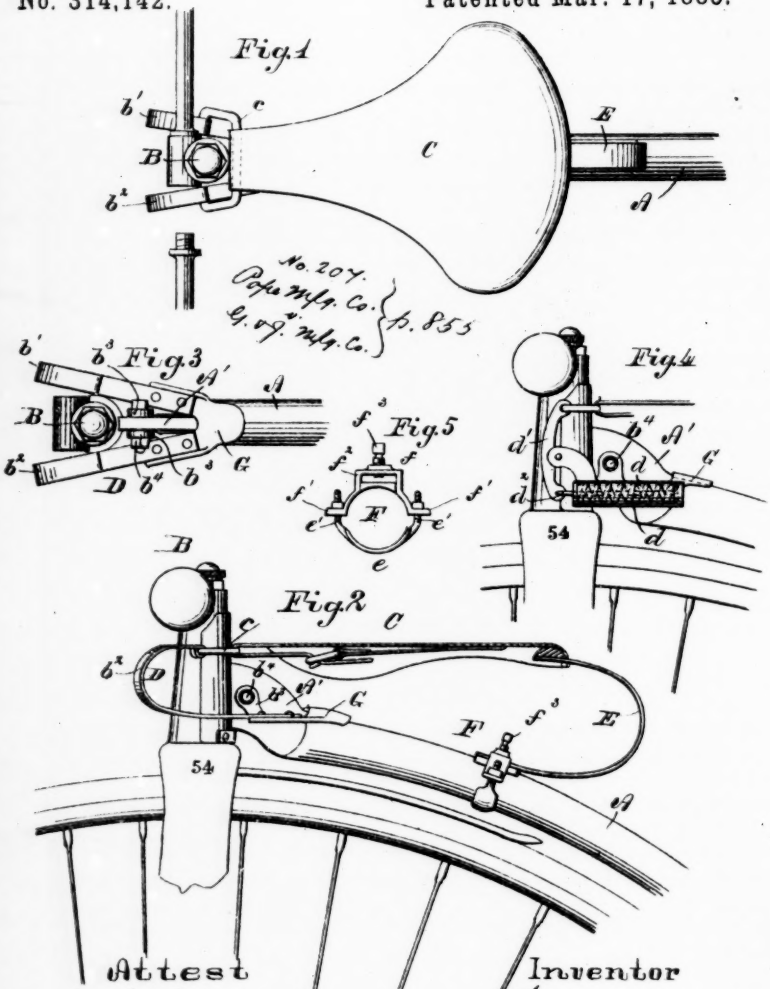
Witnesses:
H. S. SPRAGUE.
CHAS. J. HUNT.

(No Model.)

T. J. KIRKPATRICK.

BICYCLE SADDLE.

No. 314,142. Patented Mar. 17, 1885.



Attest

P. J. Clevenger.

Lon Krider

Inventor

Thomas J. Kirkpatrick

By his Attorney

Paul A. Staley

856 UNITED STATES PATENT OFFICE.

THOMAS J. KIRKPATRICK, of Springfield, Ohio.

Bicycle-Saddle.

Specification forming part of Letters Patent No. 314,142, dated March 17, 1885; application filed November 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, Thomas J. Kirkpatrick, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented a certain new and useful improvement in bicycle-saddles, of which the following is a specification.

My invention relates to that class of bicycle-saddles in which a flexible seat is suspended directly from a saddle spring or springs without the use of an intermediate saddle frame or tree; and my invention consists in a peculiar arrangement of front and rear springs secured independently to the reach or "backbone" of the machine in connection with the flexile seat suspended at the front and rear from said springs.

My invention further consists in the combinations and arrangements of parts hereinafter described and claimed.

(Here follows diagram marked p. 855.)

In the accompanying drawings, which for a part of this specification, figure 1 is a plan view of my saddle in place on a bicycle, one of the handles of the "machine" being removed to better show the forward spring. Fig. 2 is a side elevation of the same, with the flexile seat shown partly in section. Fig. 3 is a plan view of a part of the front of the machine, showing the front spring thereon, the flexile seat being removed. Fig. 4 is a side elevation showing a modification of the front spring, and Fig. 5 is an end elevation of the clip for holding the rear spring.

Like parts are indicated by similar letters of reference throughout the several views.

In the said drawings, A represents the reach or backbone of an ordinary bicycle, and B the "head" of the same, into which the said backbone is pivoted in the ordinary manner.

C is the flexile seat, which is supported at the front and rear, respectively, by the springs D and E. These springs D and E are secured independently to the perch or backbone A, each spring being preferably secured as nearly as practicable under the end of the saddle to which said spring is attached. By this arrangement the space under the saddle is left entirely free, there being no intervening mechanism or device between the saddle and the perch. This, in connection with the springs at both ends, is a very desirable feature, since the saddle is thus capable of a long vertical vibration without anything to interfere with or chafe the legs of the rider. The rear spring, E, I preferably make of flat steel, one end of said

spring being riveted or otherwise secured to a cross-piece, *a*, to which the rear portion of the flexile seat is secured. The spring E is bent down, so that the lower end comes under the saddle, and is secured to the backbone A by a suitable clip, F.

In order to extend the suspended flexile seat as far forward as possible, and at the same time secure the full elasticity of the forward spring, D, I construct the said spring with two wings, b' b^2, adapted to extend forward of the head B and turn upward and backward to connect with the forward end of the seat C. The seat C is preferably attached to the wings b' b^2 of spring D by a loop, *c*, adapted to extend around the head B, the ends of said loop being journaled, respectively, in the ends of the wings b' b^2. The wings b' b^2 are preferably made separate, and riveted or otherwise secured at their lower ends to a metallic clip, G, said clip being bifurcated and provided on either side with small ears b^3, adapted to extend up on either side of the flat portion A′ of the backbone, commonly called the "neck." The clip G is secured to the backbone by a single bolt, b^4, which passes through the neck A′ and through the ears b^3. The bolt commonly used for holding the front end of the ordinary saddle-spring may be used for this purpose. The rear end of the clip G rests on the top of the backbone A. The top of the spring D, to which the seat is attached, being considerably above the bolt b^4, said bolt acts as a fulcrum, which brings the strain on the rear end of the clip G in a downward direction and directly on the backbone A.

In Fig. 4 I have shown a modification of the front spring, D. The clip G is provided on either side with pockets *d*, in which are enclosed small coiled springs. The forward end of each pocket supports a fulcrum, in which is pivoted a small lever, *d′*. The loop *c* is attached to the upper ends of the respective levers *d′*, the lower ends of said levers being connected by suitable connecting-rods, d^2, to the coiled springs in the pockets. The connecting-rods d^2 are preferably made sufficiently long to extend entirely through
857 the springs and connect to the far end of said springs, so that the resilience of the springs is obtained by compression. The clip F, which holds the lower end of the rear spring, E, is made in two pieces, *e* and *f*. The lower part, *e*, is provided at each end with screw-threaded studs *e′*, adapted to extend up through lugs f' f' on the upper part, *f*, of said clip, and to receive nuts by means of which the said clip may be secured at any point around the backbone. The upper part, *f*, of the clip is provided with a small housing, f^2, adapted to receive the lower end of the spring E. In the top of the housing f^2 is a small set-screw, f^3, by means of which the spring E may be held against longitudinal movement through the housing, the said spring being thus adapted to be moved backward or forward through the housing or removed and replaced, as desired.

I have shown the forward end of the flexile seat passed through the loop *c*, and provided with a strap and buckle for taking up the slack or increasing the tension of the seat. If desired, however, the end of the seat may be riveted fast in the loop *c*, and the tension of

the seat regulated by slipping the spring E backward or forward through the clip F.

If desired, the loop *c*, to which the forward end of the seat is attached, may be entirely dispensed with, the front of the seat being bifurcated, as set forth in my patent No. 278,560, dated May 29, 1883, the respective wings or straps of the seat being in that case fastened directly to the wings or sides of the front spring, D.

It is obvious that the above-described saddle may be adapted to tricycles as well as bicycles, and is applicable to machines of the "Star" type as well as the ordinary bicycle.

Having thus described my invention, I claim—

1. The combination, with the perch or backbone of a bicycle or similar vehicle, of independent front and rear springs secured to said perch or backbone and a flexile seat suspended directly from said springs at the front and rear, respectively, substantially as set forth.

2. In a bicycle-saddle, the combination, with a flexile seat, of independent front and rear springs or spring connections, to which the respective ends of said seat are directly attached, one of said springs or spring connections being adapted to extend forward of the head of the bicycle, substantially as set forth.

3. The combination, with a flexile seat, of independent front and rear springs for supporting said seat, secured to the perch or backbone of a bicycle, the front spring being constructed with two wings adapted to extend on either side of the head and to connect to the forward end of said seat, and means for adjusting the tension of said seat, substantially as specified.

4. The combination, with a flexile seat, of front and rear springs, from which the ends of the seat are respectively suspended, the forward spring being bifurcated at the front end, and adapted to extend forward of the head and connect to the front end of the seat, the rear end of said spring being adapted to rest on the top of the backbone, and a bolt for securing said spring to the backbone, substantially as set forth.

5. The combination, with a flexile seat suspended at its respective ends from independent front and rear springs, of a clip for securing the rear spring to the backbone or perch, said clip being made in two parts, the lower part being provided with screw-threaded studs adapted to extend up through lugs on the upper part, and to receive nuts for securing said clip in position, and the upper part being provided with a housing and set-screw for receiving and securing the lower end of the said rear spring, substantially as set forth.

6. The combination, with a flexile seat, of independent front and rear springs, from which said seat is suspended, the said front spring being bifurcated at its forward end, and adapted to extend on each side of the head and connect with the forward end of said seat, and adapted at its rear end to rest on the backbone, to which it is secured by a single bolt, the said rear spring being secured to the backbone by a clip provided with a housing and set-screw adapted to receive and hold the lower end of said spring, substantially as described and shown.

In testimony whereof I have hereunto set my hand this 4th day of November, A. D. 1884.

THOMAS J. KIRKPATRICK.

Witnesses:
PAUL A. STALEY.
CHASE STEWART.

859 UNITED STATES PATENT OFFICE.

FREEMAN LILLIBRIDGE, of Cedar Rapids, Iowa.

Saddle for Bicycles.

Specification forming part of Letters Patent No. 337,171, dated March 2, 1886; application filed March 30, 1882. Serial No. 56838. (No model.)

To all whom it may concern:

Be it known that I, Freeman Lillibridge, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented a new and useful improvement in saddles, of which the following is a specification.

This invention relates to saddles designed more especially to be used in connection with bicycles or other varieties of the velocipede family. It however may be found useful in other applications.

It has long been known or believed that the use of many forms of the velocipede family has had an injurious effect upon the user, arising, mainly, from the irritation of the parts in contact with the saddle, produced from its improper construction and the shuffling movement thereon, consequent upon the action required to impel the vehicle.

To obviate these injurious effects and to produce an adjustable elastic saddle at a small cost is the object of this invention.

In the accompanying drawings—

(Here follows diagram marked p. 858.)

Figure 1 is an isometrical representation of my improved saddle in connection with the upper or joint-end portion of the arched bar or backbone of a bicycle, of which Fig. 2 is a plan view. Fig. 3 is an under side view of the saddle, and Fig. 4 is a transverse section of the saddle on dotted line *x*. Fig. 5 is a cross-section of the spring-confining clamp and backbone.

In the figures, A represents the upper forward portion of the arching bar or backbone of a bicycle, having its forward end portion at *a* fitted in a suitable joint form to connect with the yoke which spans the main wheel.

At B is represented a spring having its rear end portion at *b* fitted to engage the upper surface of the curved bar or backbone of the vehicle rearward of its joint-end portion, at which point it is securely fixed in an adjustable manner by means of a suitable

(No Model.)

858

F. LILLIBRIDGE.

SADDLE FOR BICYCLES.

No. 337,171. Patented Mar. 2, 1886.

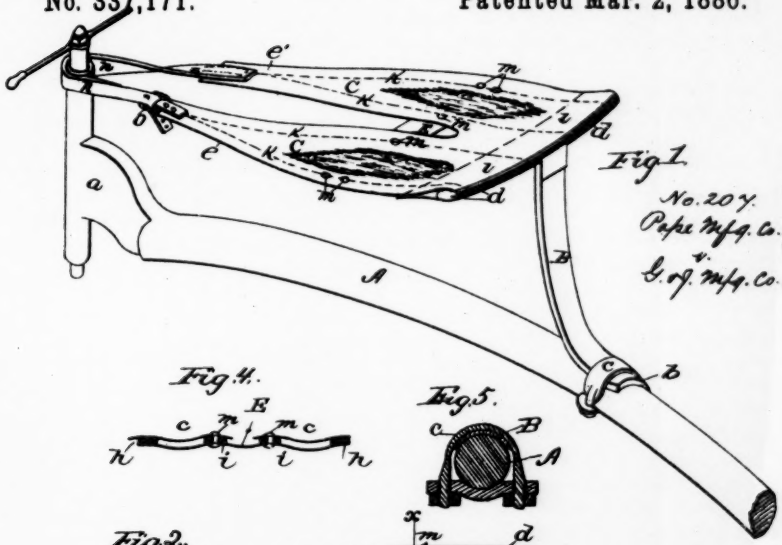


Fig. 1.

No. 207. Pope Mfg. Co. } sp. 858
G. & J. Mfg. Co.

Fig. 4.

Fig. 5.

Fig. 2.

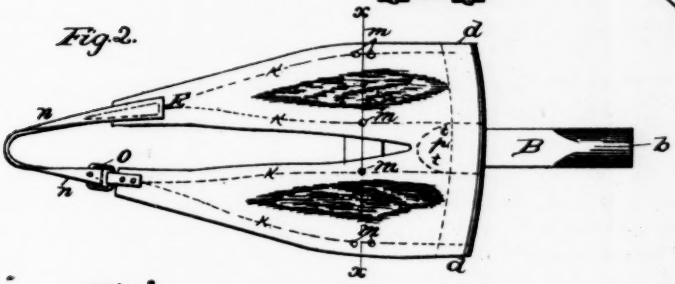
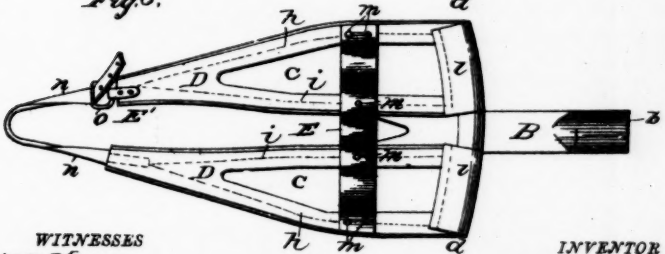


Fig. 3.



WITNESSES

W. I. King.

H. F. Carrigan

INVENTOR

Freeman Lillibridge

By L. Deane.

his Attorney

clamp, *c*, adapted to embrace the parts snugly, and by means of its screw-threaded portions serve to fix the spring firmly in its adjusted position on the curved bar. This spring, from the point of its connection with the curved bar or backbone, rises in an upward rearwardly-curving form, as clearly represented in Fig. 1, and its upper end portion is provided with a transverse bar, the lateral arms *d* of which project from the opposite sides of the spring-bar in a slightly forward-curving direction.

At C is represented the main upper or outer portion of the saddle, produced preferably from suitable leather, substantially in the bifurcated form represented in the drawings, its forward end portion, consisting of the arms *e* and *e'* springing from its rear portion.

At D are represented suitable leather braces having their rear portions bifurcated, consisting of an outer arm, *h*, and an inner arm, *i*. These braces are placed on the under side of the main portion of the saddle, with their closed end portions, D, forward centrally on the forward portions of the arms *e* of the main portion of the saddle, and their arms *h* and *i* extending rearward thereon slightly within the outer edge thereof. In this position the parts are secured to each other by suitable stitching, substantially as represented in the dotted lines *k*. The rear end of this saddle portion is folded over the lateral arms *d* of the spring and are fixed thereto by stitching, (represented by the dotted line *l*,) or instead of the stitching rivets may be employed, or the parts may be fixed in position to the transverse arms in any other suitable known manner.

At E is represented a transverse bar, made from spring-plate material, suitably curved, as shown at Fig. 4. This curved spring-bar is placed crosswise of the saddle on its under side at a suitable point rearward, and is fixed in position to the saddle by means of suitable rivets, *m*, which are passed through the parts and properly riveted; but instead of the rivets suitable screw-bolts may be employed.

At *n* is represented a strap of suitable dimensions, stitched or otherwise fixed to the forward end of the arm *e* of the saddle, from which point it extends round the forward end of the joint portion of the curved bar or backbone, as shown, and returns to engage a suitable buckle, *o*, fixed to the forward end portion of the arm *e'* of the saddle. This buckle *o* may be of any suitable variety of the known buckles, and may be joined to the saddle portion by stitching, riveting, or otherwise, to produce a secure fastening. By means of this buckle-connection of the forward end of the saddle with the parts of the vehicle I produce a ready means by which to increase or lessen the tension of the saddle.

It will be observed that by means of the adjustable connection of the spring-bar on the convex surface of the curving bar or backbone of the vehicle a change in its position forward or rearward thereon will operate to increase or lessen the tension of the saddle, and by such adjustment of the spring the length of the saddle may be varied, and such change of position of the fastening will also place the spring in a position relatively with the direction of the strain upon the saddle as to cause it to exert a greater or less sustaining force. The

position of this spring relatively with the saddle may also readily be changed by the employment of any suitable packing placed between the foot of the spring and the curved bar or backbone, either forward or rearward of the screw-clamp which connects it with the bar or backbone.

By means of these adjustments, in connection with the forward adjustment of the saddle, my improved elastic saddle is capable of any adjustment within the limits of the devices to adapt it to the wants or requirements of the party using it.

In the foregoing I have described my improved saddle as having its forward portion bifurcated, which construction I prefer; but it may be constructed in such a manner as to cause a depression of the lengthwise center of the forward portion of the saddle without the central opening. This may be readily produced, when the saddle-cover is in one piece, by cutting from its rear end the portion *p*, embraced between the dotted lines *t*, as shown in Fig. 2, and joining the cut edges by seaming or otherwise; but in this construction a greater width of material will be required from which to produce the saddle.

Springs as heretofore employed to support flexible saddle-seats on bicycles have been of a bow shape, curving from their connection with the rear portion of the saddle downward and forward under the seat, and rigidly fixed to the backbone of the vehicle at a point under the saddle. The rear end of this form of spring, under the weight of the rider mounted upon the seat, is made to move in an upward forward curve, which operates to place the body of the rider in an unpleasant and unnatural position, and is found very fatiguing. Further, to descend inclines with safety the rider, to maintain his equilibrium, must occupy a rearward position on the saddle to prevent forward overtipping of the vehicle, and in this position this class of spring is rendered rigid or unyielding and becomes inefficient as a spring. In my construction the spring from its connection with the rear end of the saddle extends downward and rearward and connects with the backbone of the vehicle at a point below and rearward of the saddle, and in use when depressed under the weight of the rider in any position on the saddle its movement will be downward and forward in an easy natural curve, and this downward forward yielding movement of the spring will vary with the varying position of the rider upon the seat, increasing with his varying rearward position on the saddle and decreasing with his varying forward movement thereon.

I claim as my invention—

1. A flexible saddle-seat consisting, essentially, of the bifurcated upper outer surface having bifurcated braces, substantially as hereinbefore set forth, joined to its under surface, for the purpose stated.

2. The bifurcated saddle-seat having the under surface strengthened by means of forked braces which follow the lines of its outer and inner edges, in combination with the metallic flexible braces located as shown, by means of which the seat at that point is kept extended, substantially as and for the purpose hereinbefore set forth.

3. The bifurcated saddle-seat provided on its under side with the

forked braces which follow the line of its outer and inner edges, and the metallic flexible transverse brace, in combination with the vertical jointed portion of the vehicle, to which it is attached as a support for its forward portion by means of an adjustable encircling-strap, which enables the seat to be tightened or relaxed at will, substantially as and for the purpose hereinbefore set forth.

4. The combination of the bifurcated saddle seat having the under surface strengthened by means of forked braces which follow the lines of its outer and inner edges, and the metallic flexible brace located as shown, by means of which the seat at that point is kept extended, with the curved uprising spring adjustably attached at its foot to the curved bar and provided with a transverse bar at its upper and free end, substantially as and for the purpose hereinbefore set forth.

5. The combination of the curved uprising spring adjustably attached at its foot to the backbone of the vehicle and provided with a transverse bar at its upper and free end, the bifurcated saddle-seat connected therewith, having its under surface strengthened by the forked braces which follow the lines of its outer and inner edges, and the metallic flexible brace, located as shown and for the purpose stated, with the vertical jointed portion of the vehicle, to which the saddle-seat is attached as a forward support by means of an adjustable encircling-strap, which enables the seat to be tightened or relaxed independently of the adjustable spring, substantially as and for the purpose hereinbefore set forth.

6. The combination of the bifurcated saddle-seat having its under surface strengthened by means of a forked brace which follows the line of its inner and outer edges, with the curved uprising spring adjustably attached at its foot to the curved bar and provided with a transverse bar at its upper free end, substantially as and for the purpose hereinbefore set forth.

861 7. The combination of the bifurcated saddle-seat having its under surface strengthened by means of forked braces which follow the lines of its inner and outer edges, and the curved uprising spring adjustably attached at its foot to the curved bar of the vehicle and provided at its upper free end with a transverse bar with vertical jointed portion, to which the saddle-seat is attached as a support by means of an adjustable encircling-strap, which enables the seat to be tightened or relaxed independently of the adjustable spring, substantially as and for the purpose hereinbefore set forth.

8. The combination, with the backbone of the vehicle and with the flexible saddle, of the curved uprising spring provided at its upper end with a transverse bar and adjustably attached at its lower foot and to the backbone of the vehicle in such a manner that the seat can be raised or lowered as desired, substantially as and for the purpose herein set forth.

9. A spring which forms the rear support of a flexible saddle-seat and is adjustably attached at its lower end to the backbone of a bicycle.

10. A spring which forms the rear support of a flexible saddle-

seat and is adjustably attached at its lower end to the backbone of a bicycle by means of an encircling-clip.

11. A spring which forms a rear support of a flexible saddle-seat and is attached at its lower end to the backbone of a bicycle at a point which is below and to the rear of said seat, for the purpose specified.

12. A spring which forms the rear support of a flexible saddle-seat which is attached at its foot to the backbone of a bicycle, and which has its flexible portion situated to the rear of and below the seat, for the purpose specified.

13. A spring which forms the rear support of a flexible saddle-seat and which bears on its lower end a curve, which, in connection with the curve of the backbone, to which it is adjustably attached, forms an adjustment in height, substantially as and for the purpose set forth.

14. A flexible saddle-seat suspended at its front end from the neck or upright jointed portion of the backbone, and suspended at its rear end by a spring, the lower end of which is attached to the backbone, and the flexible portion of which is situated to the rear of and below the seat, substantially as and for the purpose set forth.

FREEMAN LILLIBRIDGE.

Witnesses:
JACOB BEHEL.
A. O. BEHEL.

863 MORTIMER NELSON.

Improvement in Riding Saddles.

Specification forming part of Letters Patent No. 27824, dated April 10, 1860.

To all whom it may concern:

Be it known that I, Mortimer Nelson, of the city and State of New York, have invented, made, and applied to use a certain new and useful improvement in riding saddles; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making part of this specification, wherein—

(Here follows diagram marked p. 862.)

Fig. 1 is a plan of the saddle-tree.
" 2 is an inverted plan of the metallic seat.
" 3 is a vertical longitudinal section.
" 4 is a cross-section, and
" 5 is a section of one of my springs in larger size.

Similar marks of reference denote the same parts.

The nature of my said invention consists in an arrangement of spring seat to the saddle and is an improvement upon the patent granted July 22nd, 1856, to John C. F. Saloman & Geo. E. Cooper.

M. Nelson,

Riding Saddle,

No. 27,824, Patented Apr. 10, 1860.

Fig. 3

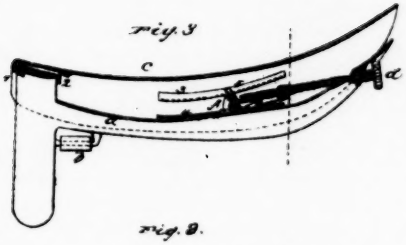


Fig. 4

Fig. 2.

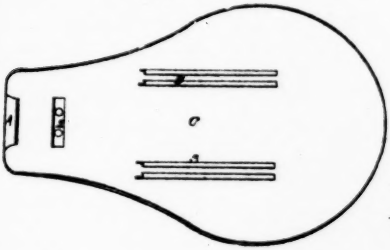
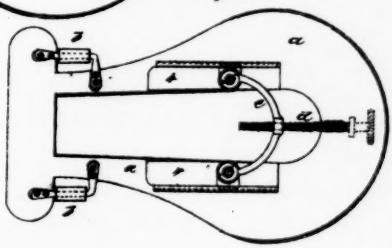


Fig. 5.

No. 207.
Pope Mfg Co.
v.
Gr Mfg Co.
p. 862

Fig. 1.



Attest
Samuel W. Skull
Chas H. Smith

Inventor
M Nelson

864 In the drawing *a* represents the saddle-tree, with the loops *b b* for the stirrup straps. *c* is the metallic seat that is hooked onto the tree *a* by the lip 1 and kept in place from sliding forward by the flange 2. This device makes a strong and durable connection between the saddle-tree and metallic seat; at the same time allows for the seat being easily unhooked and removed.

In the aforesaid patent of Saloman and Cooper a helical spring is introduced between the sliding chain and seat, immediately over the horse's backbone. This necessarily raises the seat considerably from the animal. To obviate this inconvenience and at the same time make the seat much firmer and stronger I introduce two rubber springs *f f*, or their equivalent, one on each side of the saddle-tree, and cause the same to sustain the weight of the rider, by which arrangement the metallic seat can be brought quite close down, under pressure, to the animal's back, and the parts are not liable to breakage. In order to attach these rubber or equivalent springs in place and adjust them longitudinally of the sad-
865 dle, according to the weight and convenience of the rider, I make use of slides 3 3 on the under side of the seat *c*, taking the metallic caps 5 to the springs *f f*, and 4 4 are slides on the saddle-tree *a*, receiving the cross-piece *e*, onto the ends of which the aforesaid springs *f f* rest. *d* is a screw operated from the back part of the saddle, by which the springs *f f* are moved nearer to or farther from the pummel or cantel of the saddle, as may be desired by the rider. These springs *f f*, being on each side of the saddle seat, make the same much more steady and safe in use, at the same time providing all the motion necessary for convenience in riding.

What I claim and desire to secure by letters patent as an improvement upon the aforesaid patent of Saloman & Cooper is the arrangement of the two springs *f* of rubber or equivalent material, the cross-piece *e*, and screw *d* in the manner and for the purposes specified.

In witness whereof I have hereunto set my signature this twenty-fifth day of February, 1860.

M. NELSON.

Witnesses:
LEMUEL W. SERRELL.
CHAS. H. SMITH.

E. J.; F. C. T.

[Endorsed:] Nelson patent. 14699. D., '88.

869 UNITED STATES PATENT OFFICE.

FRANCIS FOWLER, of New Haven, Connecticut.

Tricycle.

Specification forming part of letters patent No. 227,511, dated May 11, 1880; application filed March 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, Francis Fowler, of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful improvements in tricycles, which I denominate "The American Roadster," of which the following is a specification.

My invention relates to improvements in tricycles in which the curved or sloping reach of the bicycle is used and in which the front wheels form both the driven and the steering wheels; and the objects of my improvements are to provide means to more easily and quickly effect the guiding of the front driven wheels; to adapt the saddle for vertical adjustment to suit riders having different lengths of limb with effective action upon the foot-rests of the crank-axle; to obtain a durable pivotal connection of the yoke-frame with the reach, in connection with a free lever action upon the yoke-frame, and upon the reach in front of said yoke-frame to facilitate the steering of the traction-wheels; to render the driven wheels and their ratchet-connections with the crank-axles more effective as supporting and steering wheels; and to afford facilities by which the tricycle can be adapted for use upon land and upon ice without affecting the organization of the tricycle as such. I attain these objects by the construction shown in the accompanying drawings, in which—

(Here follow diagrams marked pp. 866, 867, and 868.)

Figure 1 represents a view, in perspective, of the tricycle as adapted for ice travel; Fig. 2, a vertical section taken on a line at right angles to the crank-axle and through the adjustable pivot-bearings of the reach; Fig. 3, a top view, showing the front driven wheels in position for turning short, the arrow Z indicating such turn and the arrow Z′ the line of the road; Fig. 4, a section through one of the driven-wheel hubs; Fig. 5, an end view of the hub with the outer cap removed; Fig. 6, one of the chisel-blades of the driven wheels; Fig. 7, the claw-brake of the reach-supporting wheel; Fig. 8, a sectional view, showing the seat adjusted to a high position upon the steering-post; Fig. 9, a section of one of the foot-rests of the crank-axle; Fig. 10, one of the adjustable steel pivot-bearings of the reach; and Fig. 11, a section of the wheel-rim, showing the rubber tire for land travel.

The driving and steering wheels are secured upon the ends of the crank-axle, and a small wheel supports the reach, which is of a curved form, called the "backbone," while the reach-supporting

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(No Model.) 3 Sheets—Sheet 1

F. FOWLER.

Tricycle

No. 227,511. Patented May 11, 1880.

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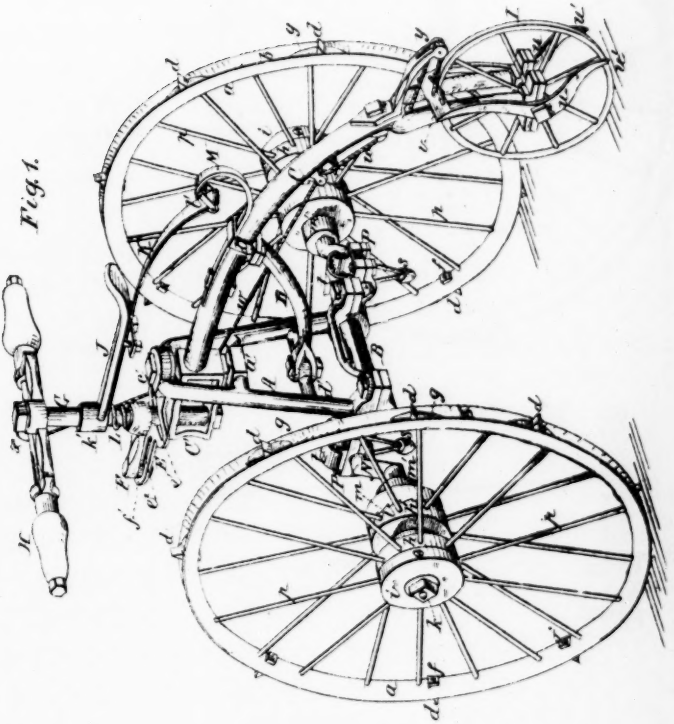
v.
G. & J. Mfg. Co.

Fig. 1.



Witnesses,
W. N. Knight
Floyd Norris

Inventor,
Francis Fowler
by Johnson & Johnson
Attys

(No Model.) 3 Sheets—Sheet 2.

F. FOWLER.

Tricycle

No. 227,511. Patented May 11, 1880.

No. 207. Mfg. Co. v. Mfg. Co. } p. 864

Fig. 2.

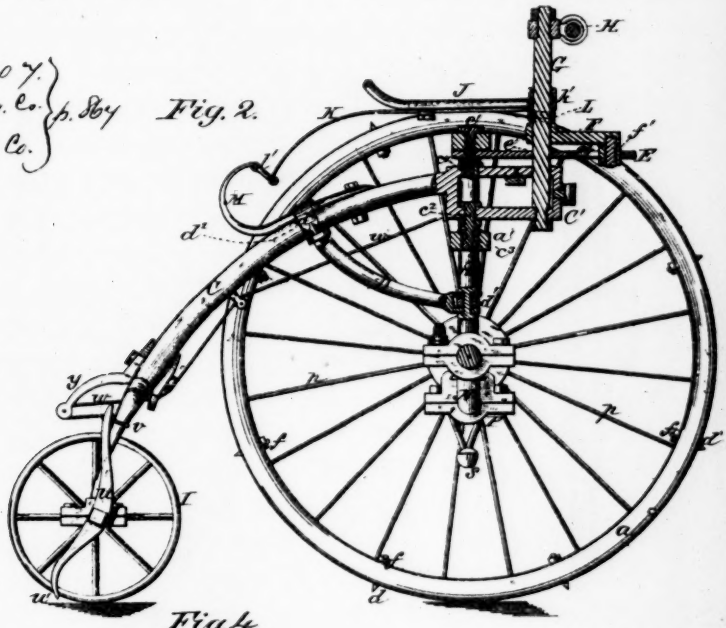


Fig. 4.

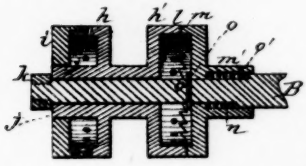


Fig. 8.

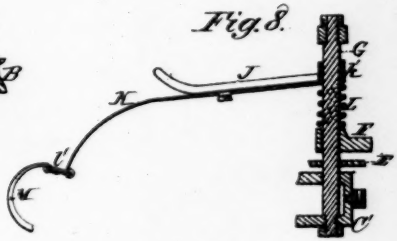


Fig. 10.

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Floyd Norris

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(No Model.) 868

3 Sheets—Sheet 3

F. FOWLER.

Tricycle

No. 227,511. Patented May 11, 1880.

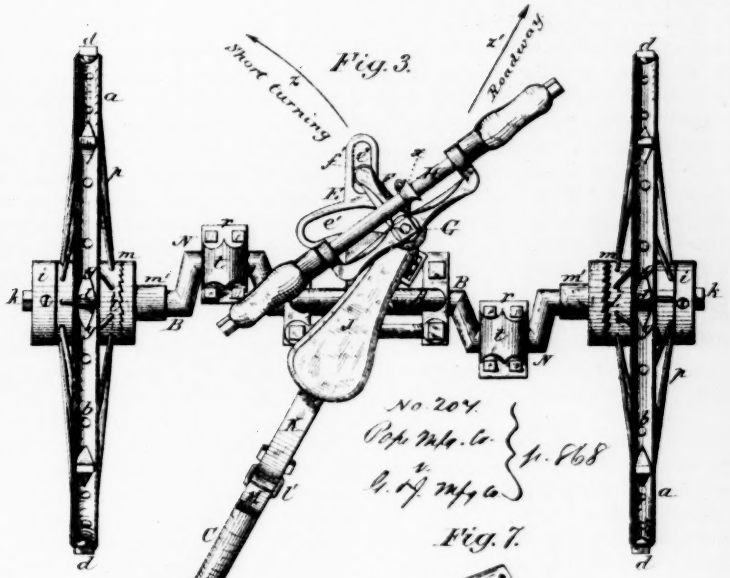
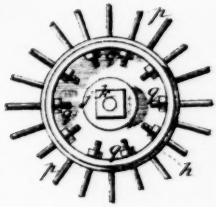


Fig. 7.

Fig. 5.



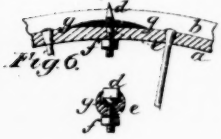
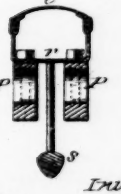


Fig. 9.



Attest
W. H. W. Tinglet
Floyd Norris

Inventor.
Francis Fowler
by Johnson & Johnson
Attys.

yoke-frame is mounted upon the axle between the crank foot-rests; and in these particulars the tricycle is the same as that patented to me February 3, 1880, and it is to such a tricycle that my present improvements relate.

The wheels are driven by the crank-axle by means of the foot-rests upon the cranks, and, in order to allow the tricycle to make a short turn upon the front wheels, they are fitted loosely upon said axles. These wheels are adapted for travel upon land and upon ice, and their several parts are of metal, the rim or rolling part *a* being formed with an outside deep circumferential groove, *b*, to receive the usual cylindrical rubber tire *c*, Fig. 11, for land travel, and which is made removable in order that steel chisel-blades *d* may be fitted within said groove so as to project beyond the circumference of the wheel and at suitable distances apart. These chisel-blades have their edges standing crosswise of the groove, and are equal in width thereto, so as to give a firm hold in the ice as contradistinguished from a mere point. They are formed with screw-shanks *c*, Fig. 6, which, passing through perforations in the bottom of the groove, are secured by nuts *f* on the inner side of the said grooved rim, the base of the chisel-blade being formed with projecting wings *g*, which, lying within the groove and upon its bed, serve to brace the chisel-blades firmly in their seats. They are easily removable to replace the rubber tire.

The hub, Fig. 4, is formed of two hollow heads, *h h'*, with an intervening recess for lightness, the outer head, *h*, being provided with a cap, *i*, which fits over a rabbeted rim on the outer hollow side of said head, and to which rabbeted rim the cap is secured by screw-bolts. The cap is also fitted over a central projection, *j*, which passes through a central opening in said cap, and besides giving a long bearing for the wheel, and thereby greater steadiness of motion, forms an end bearing for the nut *k*, which, being screwed upon the screw end of the axle, confines the wheel thereon and turns with the axle and wheel, so that the wheel-confining nuts are not liable to come off. The inner hollow head, *h'*, has ratchet-teeth *l* formed on its inner circular edge, which matches with a corresponding ratchet, *m*, formed on a head, from which a sleeve, *m'*, projects inward upon the axle. Within this sleeve a spiral spring, *n*, Fig. 4, is placed around the axle, so as to bear upon a shoulder thereon and a shoulder on the interior of the sleeve and constantly press the sleeved ratchet-head *m* in position to make a close engagement with the ratchet-head of the hub, but not to press against it, being prevented from such pressure by a stop-pin, *o*, passing through the axle, and against which the hollow face of said sleeved ratchet-head presses. This sleeved ratchet-head is therefore free to be pressed inward upon the axle by the action of the wheel to allow the latter to revolve independently of said axle in making short turns; but this sleeved ratchet-head is prevented from turning upon the shaft by a stud, *o'*, projecting from the inner side of said sleeve into a groove in the shouldered part of the axle. This relieving of the wheels from the pressure of the sleeved ratchet-

heads is important in preventing pressure upon the axle nuts when the shaft and wheels are being driven together.

The spokes *p* are of wrought-iron rods, and are arranged in two series, the inner ends of one series passing through perforations in the inner hollow ratchet hub-head, *h'*, and the outer series passing through perforations in the outer hollow hub-head, *h*, so as to give the spokes an extended base or hub connection. These spokes terminate in screw ends within the hub-heads, and are secured by nuts *q*, Fig. 5, so that these nuts are covered and inclosed by the cap *i* of the outer hub-head and by the inner sleeved ratchet-head, excluding dust therefrom. This arrangement, besides strengthening the wheel against lateral strain, serves the more important purpose of suspending the crank-axle and the rider by the upper spokes and relieving the under spokes from all unnecessary vibration.

The perforations in the grooved part of the treading-rim of the wheel are made flaring outward, so as to hold the ends of the spokes, which have conical heads to fit these perforations.

The reach-supporting yoke-frame A is mounted by suitable boxes centrally upon the crank-axle B, and its lower ends are braced by one or more cross-bars.

The upper end of the curved reach C extends through the upper part of said yoke-frame, and is pivoted thereto, between its top and a cross-bar, *a'*, by steel-pointed screw-bolts, upon which the said yoke-frame turns to guide the driven wheels.

The pivoted ends of the reach terminate in an open lever part, C', which extends in front of the yoke-frame, and it is within the upper and lower plates of this open part that the reach pivot-bolts c' c^2 are secured. The lower one, c^2, Figs. 2 and 10, of these pivot-bolts is screwed into and through the lower plate, and has its bearing in a steel step or socket, c^3, secured in the cross-bar *a'*, while the upper pivot-bolt, *c'*, is screwed into and through the top of the yoke-frame and into a steel step or socket, c^4, in the upper plate of the open reach end. While these pivot-bolts connect the reach and yoke, yet the strain and concussions upon the reach are borne principally by a curved brace, D, pivoted to a cross-bar, *d'*, of the yoke, and firmly connected to the reach by a clip, d^2, at a point back of the saddle, so that the weight of the rider and the force of concussions upon the reach are borne by the lower bearing-bolt, c^2, and this upwardly-curved brace. This brace relieves the pivot-bolts from injury, prevents the danger of snapping the backbone, and transfers the force of the concussions to the yoke-frame at a point between the pivot-bolts and the crank-axle, or near said axle. This construction gives three pivoted bearing-points for the reach upon the yoke-frame, two of which are adjustable in the yoke-frame to maintain their proper bearing with the reach, and these pivot-bolts fit with pointed ends within the steel steps to give the easiest action in guiding the front driven wheels, which guiding is effected by a construction specially designed to turn quickly and with the least power. For this purpose the open end C' of the reach, which extends in front of the yoke-frame, is utilized as a lever, the fulcrum of which is formed by the pivot-bolts, and is connected with the top

of the yoke-frame by a strong lever-arm, E, through a lever or crank arm, F, of the steering-post G, which is supported at the front end of the reach, and rises through a slot, c', formed in the lever-arm E, concentric with the reach pivot-bolts. This lever-arm E extends horizontally over the open end C′ of the reach, and is provided with a radial slot, c^2, within which is fitted an anti-friction roll, f', on the end of the lever or crank arm, F, which latter extends frontward from the steering-post above the yoke-frame lever-arm. This construction gives in effect the action of three levers, by which the steering-post effects the guiding of the driven wheels, and in which the united action of the steering-post lever or crank F, the yoke-lever arm E, and the reach-extension or open end C′ co-operate to bring the steering of the front wheels within easy and immediate control of the rider.

The double-handle steering-bar H is secured upon the top of the post G, and in turning it to the right or to the left the lever-crank F, acting by its roll f' within the radial slot c^2 of the lever-arm E of the yoke, will cause the latter to be vibrated accordingly over the steering-post by reason of the concentric slot e', and the front wheels will thus be caused to make a short turn, if desired, and in which the outer wheel will slip upon the crank-axle by reason of the ratchet-connection, thus allowing of quick turning while
871 under high speed, as shown in Fig. 3. In this action the reach is supported by its small wheel I, which may co-operate to a certain extent in guiding the machine under the action of the reach through its open end or lever part C′, and in which co-operation the said reach-lever part C′ would be carried in a direction opposite to that of the yoke-lever arm E, as shown in Fig. 3; but it is obvious that the united lever action which I have described renders comparatively easy the steering of a tricycle in which the front driven wheels serve also as the steering-wheels.

The saddle J is secured upon a long plate-spring, K, the front end of which terminates in a short sleeve, k', Figs. 1, 2, and 8, which embraces the steering-post G, and rests upon a coiled or rubber spring, L, placed upon said post and supported upon a shoulder formed by the lever-crank F, so as to bring the seat and the position of the rider centrally over the yoke-frame, and consequently directly over the crank-axle, bringing his weight in vertical line therewith, and thereby obtaining, to the fullest extent, the advantage of the highest speed in a tricycle in which the front wheels are mounted upon a crank-axle driven by the action of the rider's feet upon oppositely-arranged cranks provided with foot-rests.

The rear end of the saddle-spring is connected by means of a link, l', to an upwardly-curved hanger, M, secured to the reach by a screw-bolt and the clip d^2, Fig. 2, which, embracing both the hanger and the reach, is secured to the upper end of the curved reach-brace D, and thus these three parts are firmly bound together by the same clip. This construction gives the advantage of a vertically-adjustable saddle to suit riders having limbs of different length, and gives full action upon the foot-rests. This adaptation for long or short limbs is obtained by the manner in which the

saddle-spring is connected to the steering-post to allow the saddle to be raised or lowered upon the steering-post and supported upon a longer or shorter spring, Figs. 2 and 8, which may be changed by removing the steering-bar and lifting the sleeved end *k'* of the saddle-spring off the post, when a spring of the proper length can be put upon the post and the saddle-spring and steering-bar replaced. For this purpose the steering-post must be of a length sufficient to allow the saddle-spring to be supported at a point thereon to suit the sweep of the crank foot-rests and the length of the rider's limbs. This feature of my invention can be applied to any velocipede in which the wheels are operated by foot-rests upon a crank-axle between front driving-wheels.

The foot-rests are secured upon the cranks N by suitable boxes P, connected by a top plate, *r*, Fig. 9, so as to support the feet above the cranks, and these foot-rests are provided with pendent weights or balls *s*, by which to keep them always in position to receive the rider's feet. They are also provided with leather lifts *t*, by which the rider may use his feet both by pressure and upward pulling.

In adapting the tricycle for use upon ice a brake is applied to the axle of the reach-supporting wheel, so as to act with claws upon the ice in rear of said wheel. It is formed of two arms, *u*, curved to form claw-points *u'*, and joined at their upper ends over the wheel and at the rear side of the divided end of the reach with the arms pivoted on each end of the short axle, and therefore at each side of the wheel.

In the normal position of the brake its claw-points are held up by a spring or springs, *v*, Fig. 2, connecting the joined ends of the arms with the reach, against which the said arms rest at a point above the wheel.

A cord, *w*, connects the top of the brake with a spool, *x*, upon the steering-bar H, which is adapted to be turned in its bearings to wind and release the cord, which passes over rolls on the under side of the reach and on a bracket, *y*, projecting therefrom over and back of the connected ends of the claw-arms, so that the winding of the cord pulls out the top of the brake and depresses the claw-points into the ice on each side of the wheel. Placing the claw-points on each side of the reach-supporting wheel and joining them at the top, so that both the claws act at once, renders the brake very effective. Its attachment to the axle of the wheel renders it easily removable, and the joining of the claw-arms forms a bearing upon the reach when the brake is not used.

For land travel a wheel-brake may be applied in my said patent.

The rider sits upright upon the saddle, with the tiller-bar H in front, by which he guides the machine and controls the brake while driving the front wheels by treadle action upon the crank foot-rests.

By this construction the yoke-frame and the reach are connected near the axle, and are adapted for free action thereon, and they stand below the tops of the front wheels, thereby lessening, to a great extent, the liability of the reach being thrown over when

under high speed by the striking of the reach-wheel upon a stone or from other cause.

In using the tricycle for ice travel the circumferential rubber tire *c* of the reach-supporting wheel is removed, leaving a double-edged rolling tread like the gutter of a skate. The front driven wheels will also have such edge rolling treads, which, in connection with the chisel-blades, give the required traction upon the hard smooth surface of the ice. The seat extends forward of the yoke-frame, so as to allow the rider to sit forward of the propelling-axle in ascending hills, in which position the rear wheel will be relieved of much friction and render the ascent less laborious.

I claim—

1. The combination, in a tricycle, of the yoke-frame supported upon the crank-axle between the driven wheels, and the curved reach supported by a rear wheel, with the adjustable pivot-bolts c' c^2 in the yoke and in the reach, and their step-bearings c^3 c^4,
872 forming the pivot-bearings for the reach, substantially as and for the purpose herein set forth.

2. In a tricycle, the combination of the yoke-frame supported upon the crank-axle between the driven wheels, and the curved reach supported by a rear wheel, with the adjustable pivot-bolts c' c^2 and the curved brace D for said reach pivoted to the yoke-frame in vertical line with the said pivot-bearings, substantially as and for the purpose set forth.

3. The combination, in a tricycle, of the yoke-frame and the reach pivoted thereto and projecting in front thereof with the steering-post G, provided with a crank-lever arm, F, and the front projecting yoke-lever arm, E, having a free connection with said yoke-lever arm, whereby the steering of the front driven wheels is effected through the united and co-operating lever action of the steering-post, the pivoted reach, and the yoke-frame, substantially as herein set forth.

4. The combination of the yoke-frame, the reach pivoted thereto, and the steering-post carried by the reach in front of its pivots, substantially as described, with the frontward-projecting yoke-lever arm E, provided with the radial slot c^2 and the segmental slot c', and the frontward-projecting post-lever arm F, the said post and its lever-arm having a free connection with said yoke-lever arm E through said slots, substantially as and for the purpose herein set forth.

5. The combination of the reach pivoted to the yoke-frame A and extending in front thereof, substantially as described, with the steering-post G, having a free lever-connection with said yoke-frame and with the reach C, and operating to guide the front driven wheels through the yoke-frame and the reach, substantially as herein set forth.

6. The combination of the driven wheels, operated by a crank-shaft by foot-rests thereon, with a vertically-adjustable saddle-support, K, having a free-sleeved connection, k', with the steering-post G, and resting upon a spring, L, thereon, whereby the saddle may be

adjusted upon said post in relation to the foot-pads to suit the length of the rider's limbs, substantially as herein set forth.

7. The combination of the steering-post G, arranged in front of the yoke-frame A, and connected therewith and to the pivoted reach C, substantially as herein set forth, with the saddle J, extending over said yoke-frame and over the pivot-bearings c' c^2 of said reach, and supported upon a spring, L, upon said post, whereby the weight of the rider is brought directly over or forward of the crank-axle of the driven wheels, substantially as herein set forth.

8. The combination of the reach pivoted to the yoke-frame and carrying the steering-post in front thereof, substantially as herein described, with the saddle-supporting spring K, connected to said post by a free sleeve-bearing, k', and to the reach by the link l' and hanger M, substantially as herein set forth.

9. The combination, in a tricycle, of the yoke-frame supported upon the crank-shaft between the driven wheels, and the curved reach supported by a rear wheel, with the sleeved heads m m', the springs n, the stop-pins o, the studs o', and the ratchet-wheel hub-heads h h', whereby the said wheels are relieved from the pressure of the driving ratchet-heads and the outer wheel allowed to turn short independently of the axle, substantially as described.

10. The combination, in a tricycle, of the driven and steering wheels loose upon the crank-axle, and having hollow hub-heads h h', the inner one of which is provided with ratchet-teeth l, with the sleeved ratchet-heads m m', having only a sliding movement upon said axle, the outer hub-head being provided with a cap, i, and a centrally-projecting hub part, j, passing through said cap and forming the bearing for the axle-nut k, the spokes of said wheels being secured by the nuts g within the hollow hub-heads, all substantially as and for the purpose herein set forth.

11. The combination of the front wheels provided with circumferential grooves for rubber tires for land travel, and which are operated by foot-rests upon a crank-axle, with removable chisel-blades d, having side bracing-wings, g, clamped within and upon the bottom of said grooves, the said chisel-blades being arranged across said grooves, substantially as and for the purpose set forth.

12. A tricycle constructed with front wheels provided with circumferential grooves for rubber tires for land travel, and which are operated by foot-rests upon a crank-shaft, the chisel-blades d, removably clamped and braced within said grooves, and the claw-arms u u', pivoted upon the axle of the reach-supporting wheel, substantially as and for the purpose herein set forth.

In testimony whereof I have hereunto set my hand.

FRANCIS FOWLER.

Witnesses:

FRANK C. SURF.

GEO. A. ISBELL.

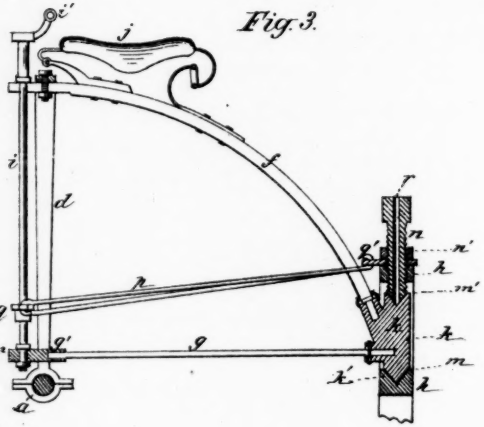
(No Model.) 2 Sheets—Sheet 2

F. FOWLER.

TRICYCLE.

No. 248,441. Patented Oct. 18, 1881.

Fig. 3.



No. 207.
Pope Mfg. Co.
v.
G. & J. Mfg. Co.
} p. 874

Fig. 5.

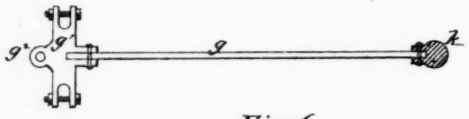


Fig. 4.

Fig. 6.

Fig. 7.

Witnesses:
Emond Brophag
Philip G. Larner

Inventor:
Francis Fowler
by Johnson & Johnson
Attys

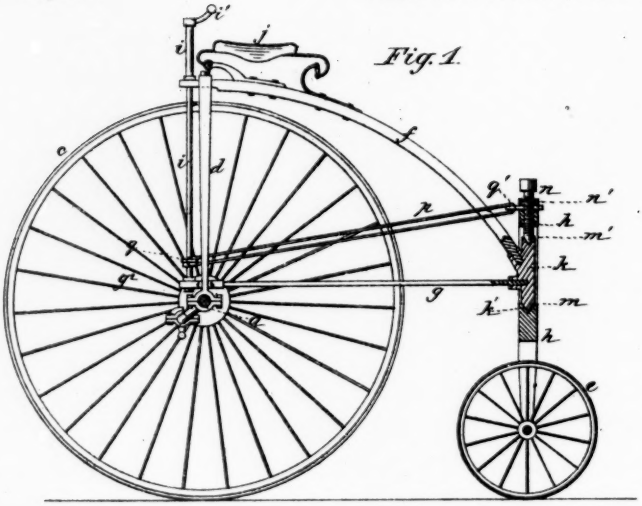
(No Model.) 2 Sheets—Sheet 1.

F. FOWLER.

TRICYCLE.

No. 248,441. Patented Oct. 18, 1881.

Fig. 1.



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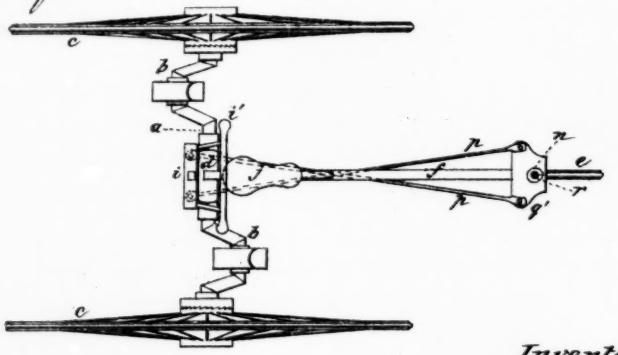
G. & J. Mfg. Co.

Fig. 2.



Witnesses:
Edmond Brodhag
Philip F. Garner

Inventor:
Francis Fowler
by Johnson & Johnson
Attys

875 UNITED STATES PATENT OFFICE.

FRANCIS FOWLER, of New Haven, Connecticut.

Tricycle.

Specification forming part of letters patent No. 248,441, dated October 18, 1881. Application filed June 20, 1881. (No model.)

To all whom it may concern:

Be it known that I, Francis Fowler, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented new and useful improvements in tricycles, of which the following is a specification.

The style of tricycle which I have improved is that having a sloping or curved reach and front propelling-wheels driven by oppositely-arranged foot-rests of the crank-axle. In my improved tricycle the reach-supporting wheel forms the guiding-wheel, and the fork or yoke of the front driven wheels is fixed to the front end of the reach. A horizontal brace connects the lower end of the front fork with the rear end of the curved reach, and the front ends of both the brace and the reach extend in front of the front fork or yoke and form the bearings for the steering-post. The rear end of the reach is provided with a vertical double-ended bearing-pin, and the rear fork is adapted to receive said vertical bearing-pin and form therewith its lower pivot-bearing, while an adjustable screw entering the top of said fork forms the upper pivot-bearing for said pin and in vertical line with it. Cross-rods connect the lower end of the steering-post with the rear fork, and the guiding is effected by swiveling the latter upon the vertical pivot bearing-pin of the reach. By this construction the tricycle is simplified and easily guided.

Referring to the accompanying drawings—

(Here follow diagrams marked pp. 873 & 874.)

Figure 1 represents a vertical section of a tricycle embracing my improvements; Fig. 2, a top view. Fig. 3 shows the rigidly-connected reach, the front fork, and the brace; Fig. 4, the rear fork; Fig. 5, the brace; Fig. 6, the crossed steering-post rods, and Fig. 7 one of said rods.

The crank-axle *a* is formed with oppositely-arranged cranks *b*, provided with foot-rests by which the front wheels, *c*, are driven, and the reach-supporting yoke *d* is mounted upon the axle between the cranks. A small wheel, *e*, supports the rear end of the curved reach *f* by an independent swiveling fork, and the driven wheels are mounted upon the ends of the crank-axle. The front yoke, *d*, is firmly bolted to the upper front end of the reach, while the lower or rear end of the latter is connected to said front yoke by a horizontal brace, *g*, forming a rigidly-connected frame, upon which the rear fork, *h*, is adapted to have a swiveling movement in guiding the tricycle. The reach and the brace extend in front of the fixed

yoke and form the bearings for the steering-post *i*, which is operated by the rider from his seat *j*, mounted upon the reach.

The rear end of the reach is provided or formed with a vertical bearing-pin, *k*, upon which the rear fork, *h*, is adapted to have a swiveling connection above the supporting-wheel, being for this purpose provided with a vertical slot, *l*, having a seat, *m*, for the lower pivot-point, *k'*, of the pin *k*, while a screw, *n*, passing vertically through the upper end of said fork, enters its slot *l* at the top and forms the seat *m'* for the upper pivot-point of the bearing-pin. The screw forms an adjustable seat for the bearing-pin and the means for securing the reach to the guiding-fork, and when set it is secured by a lock-nut, *n'*, screwed upon the upper end of the fork. The screw has a central through-passage, *r*, in vertical line with and communicating with the bearing-pin, and forms a convenient means for oiling the bearing-pin seats, the said screw being adjusted as may be required by wear and to prevent rattling.

The steering-post and the swiveling fork are connected by crossed rods *p*, as shown in Fig. 6, which pass through the yoke and on each side of the reach, so that by turning the handle *i'* of the steering-post the reach-supporting wheel-yoke will be swiveled upon its bearing-pin to guide the tricycle. In this action the crossed rods operate with a pulling and a pushing force. The connection of these rods with the steering-post is made by an armed attachment, *q*, and a similar attachment, *q'*, serves to connect said rods to the top of the swiveling fork. A convenient means of securing the fork attachment for the guiding-rods is by the clamping action of the lock-nut of the adjustable screw. The crossed rods are pivotally connected to their armed attachments.

The brace is preferably of tubing, and is suitable bolted to the front yoke by a cross-head, *g'*, having an eyed extension, g^2, for the lower bearing of the steering-post, while both the brace and the reach are secured to the bearing-pin by suitable extensions thereof, or in any proper way. The brace is important as a means of giving strength and stiffness to the reach or "backbone," and relieving the crossed guiding-rods of all strain. But for this function of the brace there would be more or less strain upon the guiding-rods exerted in a manner tending to wear the bearing-pin pivots irregularly and to displace them from their seats. The brace, the reach, and the front yoke form a rigid frame upon which the swiveling fork and the steering-post are mounted, and the guiding-rods connecting the swiveling yoke renders it easy to direct the velocipede.

876

The seat is suitably mounted upon springs, the fixed yoke is provided with anti-friction-roll bearings for the crank-axle, and the driven wheels may be fixed or fitted loosely upon the axle with provision for effecting the driving-connection therewith.

I have stated that I have improved a certain structure of tricycle, and I mean such as patented to me February 3, 1880, and May 11, 1880, in which the front driven wheels serve as the steering-wheels. My present improvements embrace matters of construction and combinations which will be specifically pointed out in the claims, and

from which it will appear that the steering device is embraced only as an element of a combination, and that a rigid frame composed of a curved reach, the front yoke, and a brace is embraced only as an element of a combination with other elements which enter into the structure of my improved tricycle.

I claim—

1. The combination, in a tricycle having front driven wheels, of the front yoke, *d*, the curved reach connected therewith and provided with a rear double-ended bearing-pin, *k*, and the brace *g* composing a rigid frame, substantially as described, with the vertical steering-post *i*, the rear swiveling fork, *h*, and the crossed rods *p*, connecting said steering-post and rear fork, the said pin *k* having vertical endwise bearings within the swiveling yoke, substantially as described, for the purpose specified.

2. In a tricycle having front driven wheels and a rigid frame composed of the curved reach *f*, the front yoke, *d*, and a brace, *g*, the said reach having a double-ended bearing-pin, *k*, in combination with the rear wheel-fork, *h*, having a fixed and an adjustable seat for said bearing-pin, the front steering-post, *i*, and means for connecting said rear-wheel fork with the steering-post, substantially as described, for the purpose specified.

3. The combination, in a tricycle having front driven wheels and a rigid frame composed of the curved reach *f*, the front yoke, *d*, and a brace, *g*, the said reach having a double-ended bearing-pin, *k*, with the steering-post *i*, the rear swiveling fork, *h*, having a bearing-seat, *m*, the adjustable bearing-screw *n*, the lock-nut *n'*, and the steering-rods *p*, substantially as described, for the purpose specified.

4. The combination, in a tricycle having front driven wheels and a rear guiding-wheel, of the reach *f*, having a double-ended bearing-pin, *k*, braced substantially as described, with the swiveling fork *h*, having the seat *m*, the bearing-screw *n*, having a passage, *r*, coincident and communicating with said double-ended reach-pin, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FRANCIS FOWLER.

Witnesses:
GEO. A. ISBELL.
FRANK C. SWIFT.

878 UNITED STATES PATENT OFFICE.

FREEMAN LILLIBRIDGE, of Cedar Rapids, Iowa.

Saddle for Bicycles.

Specification forming part of Letters Patent No. 294,645, dated March 4, 1884; application filed January 31, 1883. (No model.)

To all whom it may concern:

Be it known that I, Freeman Lillibridge, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of

Iowa, have invented certain new and useful improvements in saddles for bicycles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

(Here follows diagram marked p. 877.)

Figure 1 is a perspective view of the saddle. Fig. 2 is an under view of one of the halves of the saddle-seat. Fig. 3 is an under view of one of the forms for the saddle-seat and one of the horns of the saddle-spring. Fig. 4 is a side view of the metallic seat for the rear spring, together with the foot portion of the spring resting thereon.

This invention relates to improvements in saddles for bicycles, and in some general particulars has the same end in view as that embodied in my application filed March 30, 1882, serial No. 56838.

The saddle-seat is made in two parts, A A, each alike, excepting that one is for the right side and the other for the left. Each part is made of leather, having the edges and center thinned from the under side, and, pressed into a round and hollow form from above the center portion, is perforated with holes for ventilation. The front ends of each part of the seat are joined by a strap, G, which passes around a support, D, on the upright post C. The support D has notches to engage with the notches on said upright. This strap-support D may be of any desired width, so as to allow the proper width for the forward ends of the saddle. I prefer a strap passing twice around the support D, and at its other end passing through the loop *e*, which is secured to the saddle A. A buckle or any like means may be connected to the strap, to enable it to be tightened. The post C is shaped to conform to the curve of the flattened portion of the neck F of the bicycle, so that the saddle may be placed as far front as possible. The foot portion of C is curved on its under surface to fit the backbone E, and is fastened to it by the clip *f*, which engages with lugs *g*. The rear end of each half of the saddle-seat is joined to a metallic form, *d*. This form, preferably of the shape shown in Fig. 3, is thickened and rounded at the rear, and has a forwardly-extending portion, which is as thin as may be desired. In the thickened part is a socket, *d'*, which is adapted to receive the horn or T-piece *h*, attached to the upper end of the spring B. The form *d* is made in the general manner described, in order to give a rounding form to the corner of the seat, and at the same time afford means for connecting the seat with the horns of the spring, so as to allow the entire seat to be level with the horns of the spring in whatever position—low or high—the spring is placed. The construction now shown allows also of a separate action for each half of the seat corresponding with the thighs of the rider, and to admit of an adjustment in the width of the seat to suit the form of the different riders by drawing the halves of the seat apart. The

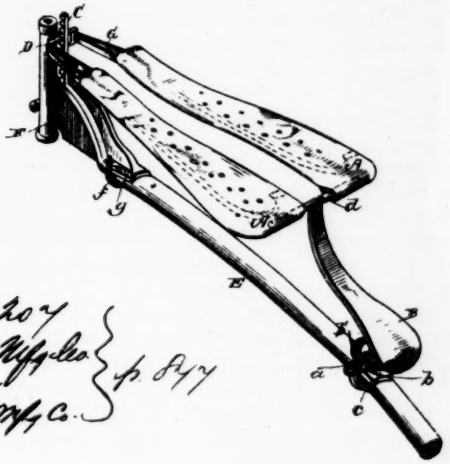
(No Model.)

F. LILLIBRIDGE.

SADDLE FOR BICYCLES.

No. 294,645. Patented Mar. 4, 1884.

Fig. 1.



No. 207
Pope Mfg. Co.
vs.
G. J. Mfg. Co.

Fig. 2.

Fig. 3.

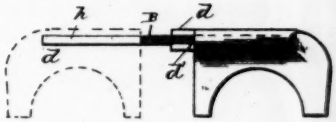
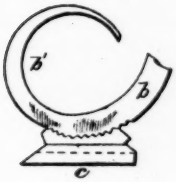


Fig. 4.



WITNESSES
F. L. Durand
Wm. A. Garner

INVENTOR
Freeman Lillibridge
per L. Deane
his Attorney

leather may be drawn over the forms and gathered and fastened on the under side; or it may be fastened directly to the under side of the form without covering it. There will be no danger of the form on either side slipping off the horn or T part of the spring, because the tension of the seat, when the seat is made and adjusted, as described, will be entirely sufficient to prevent enough lateral movement of the form at its rear for any such result, while at the same time the form will have all necessary motion to insure the desired flexibility in the seat.

The spring B is increased in width toward the base in proportion as it needs more strength, and the lower portion is turned in the form of a scroll having the foot portion *b*, which rests in the metallic seat *c*, underneath the main part of the spring. The foot portion *b*, which rests in the metallic seat *c*, is narrowed and thickened, so as to possess proper strength, but not flexibility, and is continued in lighter form, as at *b'*, to complete the scroll.

The seat *c* is curved to fit the backbone E on its lower side, and to receive the foot portion of the spring on its upper side. In the foot of the spring are fine saw-teeth to engage with those of
879 the seat, to prevent slipping. The spring and metallic seat are held in place on the backbone by means of a clip, *a*, and yoke *a'*, passing around them. By this means the spring and seat can be adjusted as desired. By this scroll form and extra width of the spring above the clip the latter is somewhat covered from view, and is out of the way should the rider fall while mounting.

The clip and metallic seat can be moved up and down the backbone, and the spring can be moved up or down in the metallic seat, to produce any height of spring, while the strap-support at the front end can be placed high or low in the notches of the post, giving the rider any height of saddle he desires.

Having now described my invention, what I consider new, and desire to secure by letters patent, is—

1. A bicycle saddle-seat made in two longitudinal parts, each composed of but a single thickness of leather lying side by side, and suspended at the rear by and movable on the T-head of an uprising spring, substantially as described.

2. A bicycle-saddle seat made in two longitudinal parts, each composed of but a single thickness of leather lying side by side, and supported in front, so that the tension on one side will reciprocate with that of the other, substantially as described.

3. A separate upright post or support combined with the fore part of the backbone of a bicycle, and constituting the forward support of a flexible saddle-seat, while its rear end is supported by a spring.

4. A post or support for a flexible saddle, having a seat adapted to be secured to the forward part of the backbone, and having its upright curved forward to support the front part of the saddle-seat.

5. In combination with a flexible saddle-seat supported substantially as described, a spring which extends backward from the seat, when it makes a turn underneath itself and is attached to the backbone.

6. A flexible saddle-seat suspended at its forward end from a post attached to the fore part of the backbone, and suspended at its rear end from a spring which extends backward from the seat, where it makes a turn underneath itself, and is attached to the backbone.

7. In combination with the flexible saddle-seat attached to its upper and free end of a spring, which extends backward therefrom, and makes a curve underneath itself, by means of which and the curve of the backbone an adjustment in height is afforded, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FREEMAN LILLIBRIDGE.

Witnesses:
CHARLES DIXON.
HENRY CLAY WAITE.

881 UNITED STATES PATENT OFFICE.

JOHN SHIRE, of Detroit, Michigan.

Improvement in Velocipedes.

Specification forming part of Letters Patent No. 216,231, dated June 3, 1879; application filed May 6, 1879.

To all whom it may concern:

Be it known that I, John Shire, of Detroit, in the county of Wayne and State of Michigan, have invented an improvement in velocipedes, of which the following is a specification.

The nature of my invention relates to an improvement in the construction of that class of velocipedes known as "bicycles;" and the invention consists, first, in the peculiar construction and application of the spring; second, in the construction and adaptation of the seat, so that it is brought into close proximity to the driving-wheel, thus allowing a wheel of greater diameter to be used than when constructed in the ordinary manner; and in the peculiar construction and arrangement of the various parts, all as more fully hereinafter described.

(Here follows diagram marked p. 880.)

Figure 1 is a perspective view of my improved velocipede. Fig. 2 is a sectional view through the standard, seat, and spring, enlarged.

In the accompanying drawings, which form a part of this specification, A represents the forward or driving wheel, mounted upon a double-crank shaft, *a*, journaled in bearings *b* at or near the lower end of the forked standard B, across the top of which is secured the head or handle C.

The rear wheel, A′, is suitably journaled between the ends of the bifurcated frame D. The forward end of this frame or standard is

880

J. SHIRE.

Velocipede.

No. 216,231. Patented June 3, 1879.

No. 207 p. 880
Pope Mfg. Co. vs.
G. & J. Mfg. Co.

Fig. 1.

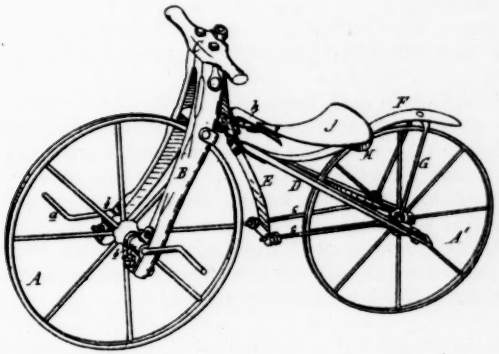
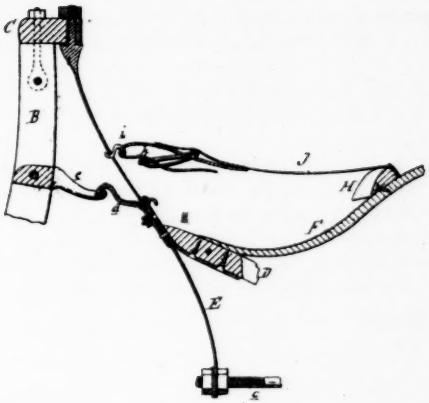


Fig. 2.



Attest:
A. Bartlett
Charles J. Kent

Inventor
John Shire
By Atty
Thos. S. Sprague

rigidly secured to the metallic spring E at or about the center thereof, the lower end of said spring being connected to the frame or standard D by means of the brace-rods *c*.

The upper end of the spring is pivoted in any proper manner to the head of the standard B.

The spring is still further connected to the forward standard by means of the hook *d*, which engages with an eye, *e*, secured to the standard, and projecting rearward therefrom for that purpose.

Secured to the top of the frame D, and extending rearward over the wheel A′, is a fender, F, the rear end of which rests upon and is secured to a forked frame or standard, G, which rises from the rear end of the frame D. To the top of this fender F is rigidly secured a seat-block, H, to which is secured one end of the adjustable hammock-seat J, the opposite end of which is provided with a strap and buckle, *h*, to engage with a loop, *i*, projecting from the rear face of the spring.

By this construction, it will readily be seen that the elasticity is derived entirely from the metallic spring E, and that the torsional strain upon the rear frame incident to the ordinary manner of construction is entirely avoided, while at the same time a much more elastic and yielding support or seat for the operator is obtained.

It will further be seen that by the use of an adjustable hammock-seat, as described, the seat may be brought into closer proximity to the driving-wheel than when constructed in the ordinary manner, which will admit the use of a driving-wheel of greater diameter.

What I claim as my invention is—

1. In a velocipede, the combination, with the driving-wheel standard B and seat-frame D, of the leaf-spring E, connecting the said standard and frame, substantially as described and shown.

2. In a velocipede, the adjustable hammock-seat J, substantially as set forth.

3. The combination, with the forward standard driving-wheel of a velocipede, of the spring E, standard D, and suitable braces *c*, substantially as described.

4. A velocipede consisting of the driving-wheel A, standard B, head C, spring E, pivoted to the head of the standard B, and connecting said standard with the frame D, wheel A′, hammock-seat J, adjustably secured to the spring E and to the block H, fender F, resting upon the standards G, and the braces *c*, constructed, arranged, and operating substantially as and for the purposes set forth.

JOHN SHIRE.

Witnesses:

H. S. SPRAGUE.
CHAS. J. HUNT.

883 UNITED STATES PATENT OFFICE.

CURTIS H. VEEDER, of Plattsburg, New York.

Seat for Bicycles.

Specification forming part of Letters Patent No. 252,280, dated January 10, 1882; application filed March 18, 1881. (No model.)

To all whom it may concern:

Be it known that I, Curtis H. Veeder, of Plattsburg, in the county of Clinton and State of New York, have invented certain new and useful improvements in seats for bicycles and other velocipedes, of which the following is a specification.

My improvements relate to the class of seats known as "saddles," and especially to devices for suspending the leather or other flexible material of which the seating-surface is composed, and for stretching or taking up the slack in the same, and for connecting the same with the perch or supporting-bar for the seat, and by means of which the seat is made adjustable backward and forward over the perch or bar; and my present invention, which is in the nature of improvements upon devices heretofore shown and described by me in applications for letters patent, consists, first in a divided metallic spring or supporting-plate for the flexible seat; second, in a modification of that portion of said metallic spring which forms the frame-work for the rear of the seat; third, in mechanism for elongating or extending said metallic spring so as to take up the slack of the flexible seat; and, fourth, in mechanism for completing the support of the seat and connecting the same with the perch or supporting-bar of the vehicle, so as to be adjustable backward and forward thereon; and the nature and scope of my invention will be more fully apparent from the following description, taken in connection with the accompanying drawings, in which—

(Here follows diagram marked p. 882).

Figure 1 shows a contrivance embodying my improvements in one form as it is attached to a perch of a bicycle, a segment of which appears in the drawings. Fig. 2 shows in rear elevation the supporting and connecting mechanism and the perch in transverse section. Fig. 3 shows the duplex spring-plate in top plan, without the flexible seat. Fig. 4 shows the part of the spring-plate which forms support for the rear of the flexible seat in a modified form. Fig. 5 shows in another form my improved supporting and adjusting mechanism for connecting the spring-plate and the perch. Fig. 6 shows a perch, with part of the seat containing a part of my improvement in section.

A is a perch or backbone for a bicycle, of which A′ is the neck or forward part of the same, bearing the spindle by which it is held in the head of the bicycle.

(No Model.) 882

C. H. VEEDER.

SEAT FOR BICYCLES.

No. 252,280. Patented Jan. 10, 1882.

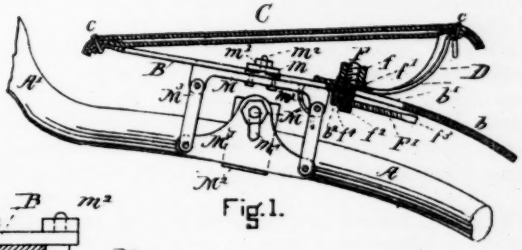


Fig. 1.

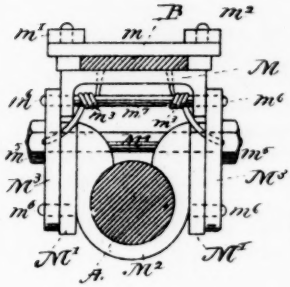


Fig. 2.

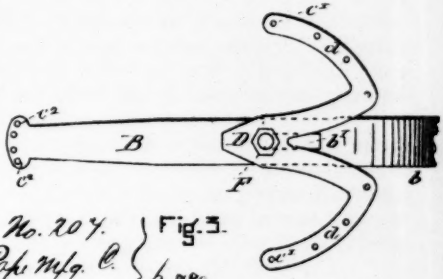


Fig. 3.

No. 207. Pope Mfg. Co. p. 882 G. & J. Mfg. Co.

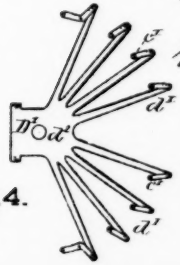


Fig. 4.

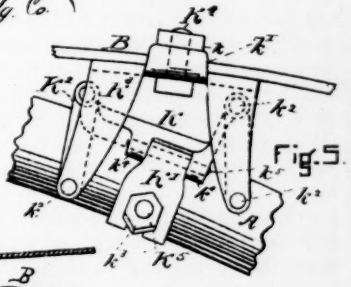


Fig. 5.

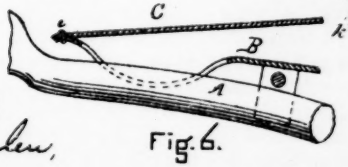


Fig. 6.

WITNESSES

C. A. Phelps,

W. C. Fogg.

INVENTOR

Curtis H. Veeder,

By his Atty,

Charles C. Pratt

B is a narrow and thin plate of steel, adapted at one end to receive the point or forward end of the flexible seat C, which may be attached thereto by rivets *c* in the perforations c^2 c^2, or otherwise, and having toward its rear end, *b*, an elongated slot, *b'*, the rear end, *b*, being free, and it may be extended, as shown in Fig. 1, as a guard, or it may be cut off immediately back of the slot *b'*. This spring-plate B may be constructed, as shown in Figs. 1 and 3, as an undivided plate, or, as shown in Fig. 6, as a divided one—that is, the part between the point or front end and the place where the clamp is attached into two divisions having a curved form—the object of this latter construction being in part to give a greater length of the spring, and so more elasticity, and in part to enable the flexible part there to be brought nearer to the perch by allowing the two branches or divisions of the plate B to pass, when depressed, one on either side the perch.

C is the flexible seating part of the seat, and may consist of one or more thicknesses of leather, with stuffing interposed or without, as may be desirable. I prefer to make it of two or three thicknesses, as shown in the drawings, and I make it narrow at the forward end, where it is attached to the end of the plate B, and wide at the rear end, where it is attached to the arms *d* or *d'* of the plate D or D', to which it may be fastened by rivets *c* in the perforations *c'*.

D is the rear portion of the spring-plate, or rather a second spring-plate, having a hole or slot in one end, d^2, or otherwise constructed so as to be held by a sliding bolt or clamp to the spring-plate B, thence extending backward and upward in a curved form in one, two, or more branches, terminating in supporting arms *d d* or *d' d'*, to form a supporting mechanism to the rear end of the flexile seat C.

F is a bolt clamp, which may be threaded at one end to receive the nut *f*, between which and the plate D may be inserted a washer, *f'*, and which works at its middle part in the slot *b'*, at the lower end of which, f^2, are rectangular shoulders, extending on either side of slot *b'*, to prevent its being drawn through said slot by tightening of the nut *f*, and by reason of which it serves, in connection
884 with the nut, to form a clamp holding two plates, B and D, together. It also has in the lower end, f^2, a threaded hole for the adjusting-bolt F'.

b^2 is a stop on the under side of the plate B.

F' is an adjusting-bolt, rectangular or otherwise, fitted to receive a wrench at one end, f^3, by which it may be turned, and threaded to work in the threaded hole in the bolt-clamp F, and so constructed that its threaded end f^4 may work against the stop b^2.

M is a metallic plate, forming a rest for the spring-plate B, which may be attached thereto by means of the clamp *m*, nut *m'*, and bolt m^2, from which M depend, by links M^3 M^3, jointed at either side the perch, the plates M'. These plates M' contain elongated slots m^4, through which passes the bolt M^4.

M^2 is a clamp grasping the perch A, by which the supporting mechanism is held to the perch rigidly by means of the bolt M^4 and nuts m^5 m^5, or similar mechanism.

m^3 m^3 are springs, attached at one end to the links M^3 and at the other to the supporting-plate M, and coiled about the red m^7 or otherwise, so as to tend by their action to keep the spring-plate B up from the perch A, with the links m^3 m^3 extended substantially at right angles to the plate B.

K in Fig. 5 is a clamping-plate, to which the links K′ on either side the perch are hinged by means of the pin k^5 and the lugs k^4, and which form—in connection with the bolt K^5, threaded at each end, and the nuts K^3, working thereon at each end, and said bolt passing through slots in the lower ends of the links K′ and on the under side of the perch A—a clamping mechanism of modified form.

By the hinges k^2 k^2 and the links K^2 K^2 are supported the arms K^3, extending downward from a metallic supporting-plate under the spring-plate B, and to which the latter is held by means of lugs k', bolts K^4, and nuts k, as shown in Fig. 5.

This improved mechanism, when constructed substantially as shown in Fig. 1, furnishes a very elastic seat, owing to the springing qualities of the metallic plates B and D and the flexible material C. It is readily attachable to and detachable from the perch or supporting-bar of a velocipede by means of the clamping mechanism shown. It is adjustable by the latter to any point on the perch or bar. The flexile material C is easily brought to the proper tension in the first place, or afterward, to take up the slack caused by use, by turning the adjusting-bolt F′ so as to force the clamping-bolt F backward from the stop b^2, thus extending the reach of the spring-plates, and which is easily accomplished by first loosening the nut f and tightening it again after the extension has been made.

The clamping and supporting mechanism are so constructed and operated that when made as shown in Figs. 1 and 2 the seat may be adjusted at different distances within a short range above the perch, and so as to have more or less tilt forward—that is, to form a greater or less angle with the top of the perch or bar by adjustment of the plates M′ with the slots m^4 and bolt M^4 and nuts m^5. It is also adjustable to and from the front of the perch or bar, since, if, when the seat is in the position shown in Fig. 1, the rider takes his place thereon, the plate B must settle either backward or forward toward the perch by the swing of the links M^3 M^3, so as to be either nearer to or farther from the front of the perch, and this position toward or from the front will be determined by the motion and at the will of the rider when he mounts, or afterward. The utility of this backward-and-forward adjustment is obvious from the fact that in riding upgrade on a bicycle, for instance, the rider, in order to exert the greater power, wishes to have his seat as near as possible to the front of the bicycle, and in riding downgrade, where less power is required, he desires, for the safety of his equilibrium, to have his seat as far back from the head of his machine as he can. I consider the forms of back spring-plate, D, shown in Figs. 3 and 4 as substantially equivalent, form shown in Fig. 3 being preferable for economy of manufacturing, and the form shown in Fig. 4 being preferable for elasticity.

The form of supporting and clamping device shown in Fig. 5 is a modification of that shown in Figs. 1 and 2, the vertical adjustability being dispensed with, and the inclination of the top of the saddle being fixed by the shape of the plate K. It is a simpler form to construct, and it retains the adjustability to and from the front of the machine to some extent, and also allows of a rocking motion backward and forward to a slight degree, relieving the legs of the operator from the rigidity of the operation of a fixed seat, the more especial advantage of this form of rocking attachment, as well as of the other one shown, arising from the fact that with the ordinary rigid construction whenever the rear wheel of the bicycle strikes a pebble or other obstacle it gives a jerking motion to the perch, which is imparted to the rider, and this is largely overcome by the present improvement.

The supporting-plate M may be made shorter longitudinally under the spring-plate B than the proportions shown in Fig. 1, where the plate B is of sufficient strength, in order to allow more flexibility.

I do not wish to be understood as confining myself to the specific form or attachments of devices shown and described, nor as limiting their application to the perch of a bicycle, since they may be varied as to their details, and are easily applicable to other forms of velocipedes carrying a seat for and propelled by the rider.

I am aware that a spring has been used to support the seat or saddle of a bicycle. I therefore do not claim the general application of a spring for this purpose; but I do claim the improved form of spring as herein described.

I claim as new and of my invention—

885 1. A suspension-saddle constructed with a flexible portion, C, and having an under spring in two or more parts, B D, to which the flexible portion is attached at either end, and which metallic parts are extensible, substantially as and for the purposes set forth.

2. In a velocipede-seat, the combination of plates B and D, clamp F, stob b^2, and adjusting-bolt F′, substantially as shown and described.

3. An adjustable supporting device for a velocipede-seat, consisting of a clamp, by which it is held to the perch or supporting-bar, depending links, and arms connected therewith and adapted to be connected with and to support the spring-plate of the saddle, substantially as set forth.

4. A supporting and adjusting device for a velocipede-saddle, consisting of slotted plates M′ M′, links M^3 M^3, and suitable connecting and clamping mechanism adapted to hold the same to a perch or supporting-bar and the spring-plate of a saddle, and constructed to operate substantially in the manner and for the purposes set forth.

5. In combination with the supporting-plate M and links M^3 M^3 and plates M′ M′, the spring m^3, constructed and attached substantially as and for the purposes set forth.

6. A spring-plate for a suspension-saddle, having its rear portion divided into two or more curved arms or branches, constructed and

adapted to support the rear end of a flexible seat, substantially as shown and described.

7. In the supporting mechanism of a seat to a bicycle, the spring-plate D, with two or more curved arms, in combination with the plate B, substantially as and for the purposes set forth.

8. In combination, a supporting and adjusting device for a velocipede-saddle, consisting of the parts K K' K^3 K^5, suitably connected and attached by clamping mechanism to a perch or supporting-bar with the spring-plate of a saddle, all substantially as and for the purposes set forth.

CURTIS H. VEEDER.

Witnesses:
A. GUIBORD.
GEO. W. WATSON.

[Endorsed:] Veeder.

888 115,772.

UNITED STATES PATENT OFFICE.

GEORG F. SCHMIDT, of Kiel, Prussia, assignor to Rudulph Schmidt.

Improvement in Riding-Saddles.

Specification forming part of Letters Patent No. 115,772, dated June 6, 1871.

To all whom it may concern:

Be it known that I, Georg F. Schmidt, of Kiel, in the province of Holstein and Kingdom of Prussia, have invented certain improvements in spring-saddles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing making part of this specification, in which—

(Here follow diagrams marked pp. 886 & 887.)

Figure 1 is a side elevation of my improved spring-saddle. Fig. 2 is a perspective view of the saddle-tree. Fig. 3 is a plan view of one of the spring-bars. Figs. 4 and 5 are views of the cantel and pommel. Fig. 6 is a side elevation with the cover of the seat removed. Fig. 7 is a plan view of the saddle-blanket. Fig. 8 shows the spiral spring and rubber plate to which they are attached to form elastic bolsters.

The same letters are used in all the figures in the designation of identical parts.

This invention relates to saddles of that class which embody springs in their construction, in order that they may readily accommodate themselves to the varying shape of the bodies of different horses, and, at the same time, form a yielding seat for the rider. My improvement consists in combining with the saddle-tree and the saddle-blanket elastic bolsters or cushions, composed of springs, and interposed between the bars of the tree and the blanket, so as to

886

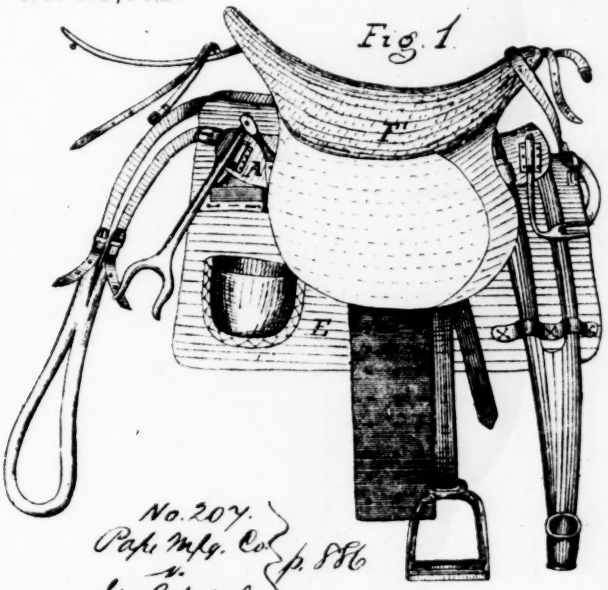
2 Sheets--Sheet 1.

GEORGE F. SCHMIDT.

Improvement in Riding Saddles.

No. 115,772. Patented June 6, 1871.

Fig. 1



No. 207.
Pat. Mfg. Co. } p. 886
v.
G. & J. Mfg. Co.

Fig. 2

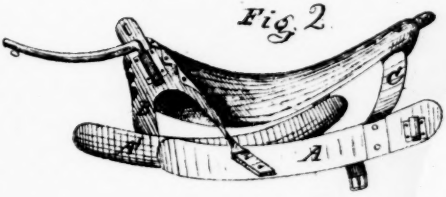


Fig. 3

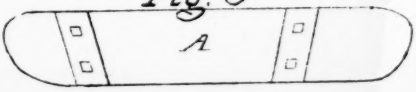


Fig. 4

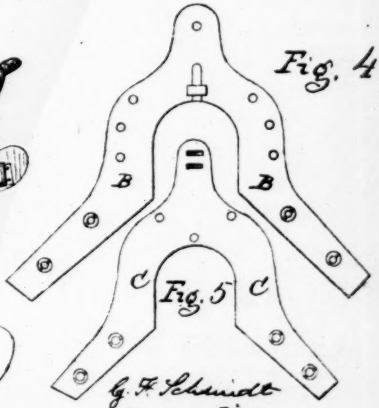


Fig. 5

Witnesses
C. H. Pearson
A. Ruppert

G. F. Schmidt
Inventor
D. P. Holloway & Co
Attys

2 Sheets--Sheet 2.

GEORGE F. SCHMIDT

Improvement in Riding Saddles.

No. 115,772. Patented June 6, 1871.

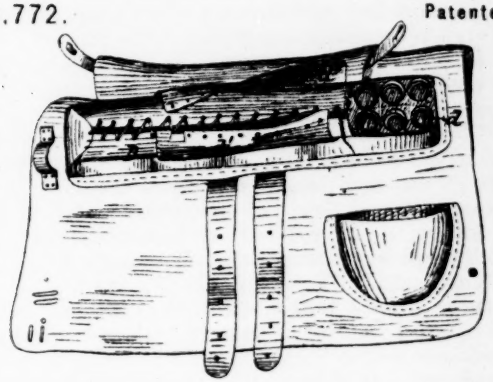


Fig. 6

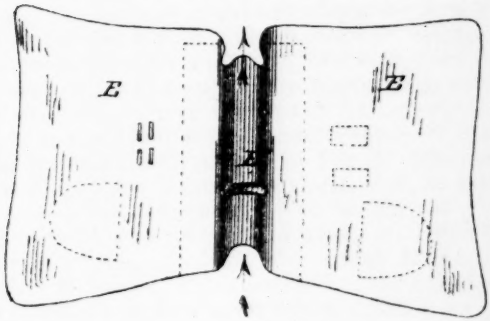


Fig. 7

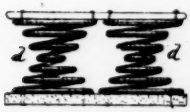


Fig. 8

Attest
C. F. Clausen
A. Ruppert

No. 207 Pope Mfg. Co. v. G. F. Mfg. Co. } p. 887

G. F. Schmidt
Inventor
D. P. Wilson & Co
Atty

form yielding surfaces of contact with the horse's sides, which sustain the superincumbent weight of the rider and make the saddle easy to the horse by reason of its yielding to the movements of the muscles of the latter while traveling.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The tree of my improved saddle is constructed of flat steel springs, of the proper width and thickness, and it is composed of the bars A A′ and the bows B and C, which are riveted or otherwise secured to the bars. The bars are about parallel to each other, the usual distance apart from each other, and slightly curved from front to rear to correspond approximately with the lines of a horse's sides, and the bow B, which forms the cantel, and bow C, which constitutes the pommel, are, respectively, bent into the required shape, substantially as shown, and so that they shall present flat surfaces to the body of the rider. The tree is mounted upon the bolsters or cushions D D′ of the saddle-blanket E. The latter is made of leather, by preference, and cut in such shape that, when it is attached to the tree, a longitudinal arched passage is formed beneath it at E′, centrally between the bars of the tree, which arch spans the spine of the horse without coming in contact therewith, and thus forms a passage through which the air may circulate to keep the horse's back cool, as well as the seat of the saddle. The bolsters are composed of a series of springs, *d*, secured upon a plate, d^2, of elastic, hard rubber, which in turn is securely fastened upon the blanket, the whole being inclosed in a receptacle formed by flaps of leather, which are stitched at one edge to the blanket and then drawn over the springs and laced in the manner clearly shown in Fig. 2. The bars of the tree are strapped upon these bolsters by straps d^1 d^1, or secured thereto in any other convenient manner. The leather seat F is suspended between the cantel and pommel, to which its respective ends are buttoned or otherwise attached, after which it is covered by the ordinary cover F′, which is also fastened to the cantel and pommel.

Suitable devices are formed at various points on the tree and other parts of the saddle for the attachment of the stirrup-girt and the various appliances which go to make up a complete cavalry-saddle. As these devices, however, do not constitute a part of this invention, I shall not describe them, but simply refer to the drawing, where they are best seen in Fig. 1.

What I claim as my invention, and desire to secure by letters patent, is—

In combination with the spring saddle-tree A A′ B C, the blanket E and spring-bolsters D D′ attached to the latter, substantially as set forth.

In testimony that I claim the foregoing specification I have hereunto set my hand and seal this 15th day of June, 1870.

GEORG F. SCHMIDT. [L. S.]

Witnesses:

JOPS. BRANDT.

P. CASATI, JR.

890 LEWIS BISHOP.

Improvement in Elastic Saddles.

Specification forming part of Letters Patent No. 22,480, dated Jan. 4, 1859.

To all whom it may concern:

Be it known that I, Lewis Bishop, of Talladega, in the county of Talladega and State of Alabama, have invented a new and improved elastic saddle; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

(Here follows diagram marked p. 889.)

Fig. 1 is a longitudinal vertical section of my improvement.

Fig. 2 is a back view of do.

Similar letters of reference indicate corresponding parts in the two figures.

This invention consists of an improved article of manufacture, viz., a saddle having a seat suspended on springs by means of loops and eyes, and otherwise made as hereinafter shown and described.

891 To enable those skilled in the art to fully understand and construct my invention I will proceed to describe it.

A represents the tree of the saddle, to each end of which an upright elastic steel bar, B, is attached. C is the seat of the saddle, which has steel loops *a* attached to it, one at each end. These loops may be constructed of flat plates or bars, or round rods may be used. The loops at each end of the seat may be formed of a single steel bar or rod bent in V-form, each loop passing through an eye, *b*, at the upper ends of the elastic bars or springs B B.

The tree A is properly covered and padded and provided with the usual straps for securing it to the back of the animal. The seat C is constructed of leather or has a leather covering, and is properly arranged so as to ensure a sufficient support. The seat is allowed to rock freely to the right and left, as indicated by arrows 1, Fig. 2, in consequence of being suspended by the loops *a* to the elastic bars B B, and the bars B B admit of a vertical play,

892 as indicated by the arrows 2 in Fig. 1.

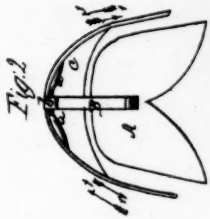
By this improvement the saddle is made to conform to the movements of the animal, and a very easy and agreeable seat obtained.

I am aware that elastic saddles have been previously constructed, but so far as I am aware a vertical play or spring has only been given the seat, no provision being made for a rocking movement. This rocking movement is an essential feature of the invention, it eases to a great extent the sudden jar attending the gait known as a trot, and as the motions of the animal can only be transmitted to

L. Bishop,

Riding Saddle,

No. 22,480. Patented Jan. 4, 1859.



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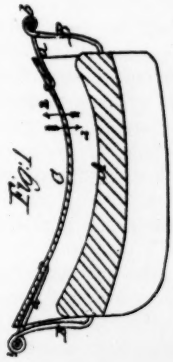
Pope Mfg. Co.
v.
G. & J. Mfg. Co.
} p. 889



the seat through the loops *a* and elastic bars B B it will at once be seen that the seat C will neutralize or ease to a very great extent the sudden jars, concussions, etc., attending the movement of the animal.

I do not claim broadly the employment or use of a spring or elastic seat attached to a saddle, for such device has been previously used, but so far as I am aware a rocking movement in connection with a vertically vibrating one has not hitherto been given
893 the seat.

What I claim and desire to secure by letters patent as an improved article of manufacture is—

A saddle having a seat, C, suspended on springs B by means of loops (*a*) and eyes (*b*) and otherwise made as herein shown and described.

LEWIS BISHOP.

Witnesses:
P. A. STOMPS.
JOS. N. SAVERY.

E. J.; F. C. T.

[Endorsed:] Bishop patent. 14699. D., '88.

895 UNITED STATES PATENT OFFICE.

JOHN C. MILLER, of Louisville, Kentucky.

Improved Spring-Saddle.

Specification forming part of Letters Patent No. 53854, dated April 10, 1866.

To all whom it may concern:

Be it known that I, John C. Miller, of the city of Louisville, State of Kentucky, have invented a spring riding-saddle for ladies and gentlemen; and I do hereby declare that the following is a full and exact description, reference being had to the accompanying drawings, and to the letters of reference thereon.

The nature of my invention is such, and consists in forming a saddle for ladies and gentlemen which is greatly superior in every respect to all other saddles now known or in use. It consists in forming a saddle that for ease and comfort, both to horse and rider, cannot be excelled or rivaled. It is superior to other saddles in cheapness, strength, durability, and beauty, and it is constructed in such a manner that it can be changed in a moment from a gentleman's to a lady's side-saddle.

The nature of my invention is such that the seat of the saddle, when upon the horse's back in use and the horse in motion, will spring upward and downward easily and gracefully, to the delight and pleasure of the rider, at the same time relieving the jerk and jar of the weight of the rider, which jerking and jarring is disagreeable and fatiguing and wearisome to the animal. The relief

hooks are for the purpose of coupling the tree and seat together by means of the coupling-holes in the frame of the seat. Reference is made to the said holes by the letter K.

The end sides or faces of the columns must be made square or flat, and the opposite side should be made sloping gradually outward in a shapely manner into a foot or base for the columns, also for strength; or they should be made with a web extending
895½ from the top of the column to the base, for the purpose of bracing and strengthening the column against the strain, which is from the ends toward the center of the tree. Reference is had to the foot or base of the columns by the letter J.

The letters H and F refer to the heads and ends of the bolts going through the columns of the tree and fastening the springs to said columns.

The letter E refers to the springs, which must be made of spring-steel about in the shape of a circular hook, which gives great elasticity to the spring. The springs can be made either flat or round, (not important;) but the flange of the spring should be made flat, so that it may be firmly fastened to the columns of the arches.

The springs should be made tapering from the corner formed by the flange to the bend forming the coupling-hook. They should be made tapering both in breadth and thickness, in order that superfluous weight may be removed and the whole saddle be as light as possible, and because the strain upon the spring gradually lessens as the end is approached, and for the purpose of giving grace and symmetry to the saddle.

The coupling-hooks of the springs should be made in such a manner upon the springs as to slip snugly and closely through the holes of the seat-frame and hold it securely in its place, and so that the seat can be removed when desired.

The letters D, Figs. 1 and 2, refer to the girth-bar in the bars of the tree, which is for the purpose of fastening the girth to the tree which fastens the saddle to the back of the horse. The girth-bar should be raised somewhat above the bar of the tree, or made less in thickness, in order that the girth, when stitched around the bar, will not form any extra thickness underneath the saddle-bar, which would be injurious and uncomfortable to the horse.

Fig. No. 2 represents a side elevation, showing one-half of the saddle-tree with springs attached and the shape of the springs.

The letter Q refers to the seat-frame. Said frame is to be cast of brass or malleable iron; can be made of wrought-iron. It should be about three-eighths of an inch in thickness by three-quarters in breadth for full-sized saddle; others in proportion to size. The shape of the frame should be oval as regards thickness; but otherwise, as regards the seat, it should arch downward at the ends and bow toward each end from the center of the seat. When the small or neck of the seat is approached the frame should be made warped, or the inside edge pointing upward, to prevent the frame of the seat from bearing uncomfortably against the leg of the rider, which leg falls over and from the seat at the small or neck of the seat. The neck or small of the seat is referred to by the letter N.

The letter W refers to the holes forming the -tirrup-bars. Their position must be regulated by the size of the saddle and the kind of saddle, whether a lady's or gentleman's saddle. Any saddler will know their position upon the different kinds and sizes of saddle-seats.

The letters L refer to the sockets in the frame of the seat. They should be sunk in the frame of the seat sufficiently to level the web-straining with the frame of the seat. The sockets should be about one-sixteenth of an inch in depth; should be two or three webs running lengthwise of the seat, and two crosswise for a man's saddle and three for a side-saddle. Upon a side-saddle one of the cross-webs should be forward of the horn. Rawhide can be used in the place of webbing, if desired. The sockets for the webbing are for the purpose of preventing it from slipping from its place. The webbing should be stitched with wax-ends, and have sufficient lap to hold stoutly. After the webbing is all on the whole frame should be covered with leather stitched at the edges of the frame.

The rounding or flat shape of the seat is regulated as desired by the drawing of the straining, which every saddler understands.

In covering the frame of the seat with leather the coupling-holes and stirrup-bars must be left bare. When this is done the seat is ready for the hood.

The hood can be made of hog-skin, enameled leather, or skirting, as desired, with or without jockeys. (Not important.) If the hood is made of hog-skin or enameled leather, it should be lined with bridle or skirting leather to prevent the webbing from cutting through the seat or hood.

In preparing the hood the lining should be dampened and drawn over the seat or a block shaped like the seat, and then allowed to dry before using. It will then preserve its shape and fit closely and smoothly, and never get out of shape.

After the hood is drawn on it should be stitched in the leather covering the frame, which will fasten it firmly to its place. When the hood is attached to the seat-frame the seat is complete and ready to be hung upon the springs of the saddle-tree, and then, when stirrups are attached to the frame at the stirrup-bars and a girth through the bars of the tree, the saddle is ready for use. No pad is necessary, and fenders should be applied to the stirrup-leathers to protect the leg from mud, &c.

The letters O refer to the head and cantle of the seat, from which the seat must slope downward to the center in the manner of a bow, and circle downward to the sides to give the necessary shape to the seat.

The letter P refers to a shoulder cast upon the inside of the frame and hole within, for the purpose of attaching a little horn by means of a screw-thread upon the horn and in the hole through shoulder,

which attachment of the horn forms a side-seat frame for the
896 use of ladies, which can be placed upon the springs of the saddle when the man's seat is taken from it, thus changing the whole arrangement from a gentleman's to a lady's side-saddle.

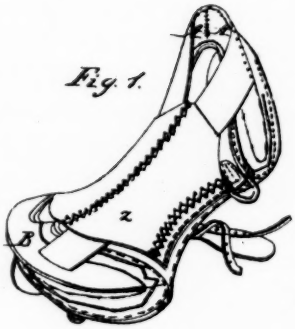
The shoulder and hole for the little horn should be placed about

J. Curry,

Riding Saddle,

No. 63,861, Patented Apr. 16, 1867.

Fig. 1.



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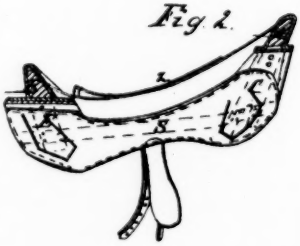
Pap. Mfg. Co. } p. 897
" Gyp. Mfg. Co

Fig 2.



Witnesses:
Geo. W. Rothwell.
Sulon C. Kemon

Inventor:
John Curry
per
Munn & Co
Attorneys

four inches back from the front of the frame to give pommel-room, and the seat for side riding should be built flat and level instead of round—that is, crosswise of the tree; otherwise the same as a man's seat. Each saddle can have two seats, one for a lady and the other for a gentleman, to be used as desired.

The letter K refers to the coupling-holes by and through which the seat is swung up the springs at the hooks marked I. The springs must bend far enough forward to allow free motion of the seat between the columns and arches. This saddle can be ornamented in the highest style known to the painter's or saddler's art. The whole tree, which is left bare to sight, can be beautifully painted or covered with quilted leather, also the springs.

The saddle, on account of its great strength, cheapness, and durability, would make a good military saddle.

What I claim, and desire to secure by letters patent, is—

Constructing the seat of the saddle separate from and independent of the bars of the tree, and hanging the said seat upon the ends of springs at a distance of several inches above the bars of the tree, all constructed as herewith described and set forth.

JOHN C. MILLER.

Witnesses:
IRA JONES.
W. J. McGONIGAL.

[Endorsed:] Miller patent.

898 UNITED STATES PATENT OFFICE.

JOHN CURRY, of Stanford, Kentucky.

Letters Patent No. 63,864, dated April 16, 1867.

Improvements in Saddles.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, John Curry, of Stanford, in the county of Lincoln, and State of Kentucky, have invented a new and improved saddle; and I do hereby declare the following to be a full, clear, and exact description of the same sufficient to enable one skilled in the art to which the invention appertains to make use of it, reference being had to the accompanying drawings, which are made a part of this specification, and in which—

(Here follows diagram marked p. 897.)

Figure 1 is a perspective view.

Figure 2 is a longitudinal vertical section.

This is an improvement upon the Murdock spring saddle in respect of the mode of constructing the pommel or gullet and the cantle so as to enable them to bear the strain of the rider's weight when supported on the webbing, which is suspended between the two.

The pommel and the cantle respectively are made of solid wooden pieces supported upon metal plates, which are riveted to the side bars, which maintain them in their required relative position.

In the drawings the forward part of the saddle is called the head-piece or gullet and sometimes the pommel, though that term is perhaps more properly applied to the crown or more elevated portion.

The head piece, according to my improvement, is constructed as follows: A wrought-iron plate, C, is arched sufficiently to span the withers of the horse, the plate being forked at its ends for the more convenient and secure attachment of the side bars S, which have a certain degree of elasticity, and forming the connecting portion of the tree between the head-piece and the cantle. The plate C should be not less than one-eighth of an inch thick, and above it are two pieces of oak shaped to fit the plate and securely riveted to it, and fitted together at the pommel by a long, oblique joint diagonally across the grain of the wood, and well fastened. The pieces A are butted against each other, making a pommel, and are secured to the plate by screws passing up through the latter and are then wrapped together with the plate C in a rawhide covering, which is sewn and shrunk upon them. The screws which enter the plate C and pass into the crotch A are countersunk so as to make them lie smoothly without projecting and enter the wood near its inner edge so as to brace it more firmly against the strain when the weight of the rider on the webbing tends to tip the pommel and cantle towards each other. The cantle B is made in the same way as the head-piece, excepting that the wood-work of the cantle is made in one solid piece, with the grain of the wood running crosswise of the tree and lapping upon the cantle-plate E, which is screwed to the cantle and then wrapped up with it in a rawhide covering, which binds and strengthens the whole. Straining holes for thongs and stitches are provided on the head-piece and cantle, which are riveted to the side bars S. V V are holes in the cantle, through which the webbing is passed. The latter is secured in any sufficient panel to the pommel and cantle respectively after having the stretch taken out of it to adapt it to bear the seat Z. A side saddle is made by having a large and small horn made on the head-piece and the required square form given to the cantle.

Having described my invention, what I claim as new, and desire to secure by letters patent, is—

The saddle constructed with head-piece and cantle mounted upon and secured respectively to bent plates C E, united by metallic side plates and forming a skeleton frame for the support of the suspended seat.

To the above specification of my improvement in spring saddles I have signed my hand this third day of December, 1866.

JOHN CURRY.

Witnesses:

SAM. BAUGHMAN.

T. M. REDD.

[Endorsed:] Curry patent.

C. H. HARRIS.

Spring Saddle.

No. 163,769. Patented May 25, 1875.

No. 207.
Pope Mfg. Co. } p. 899
v.
G. & J. Mfg Co

FIG. I.

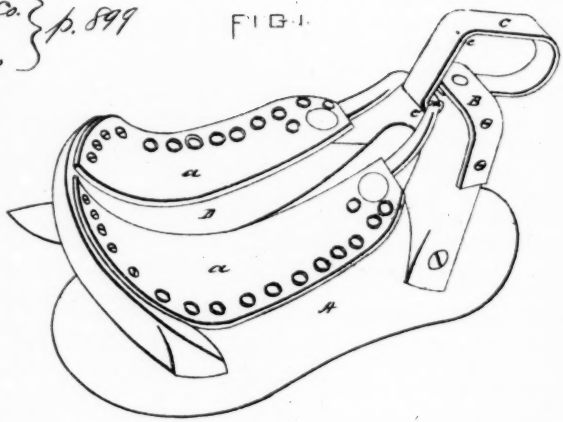
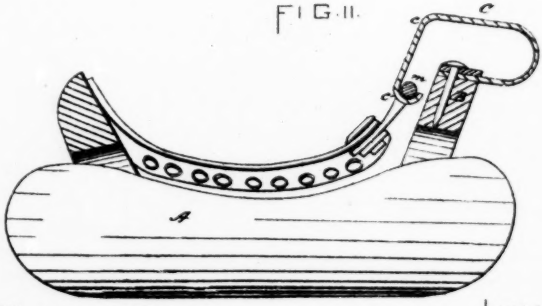


FIG. II.



WITNESSES

F. B. Townsend.
James Stevenson

INVENTOR

Charles H. Harris
per attys
A. H. Evans & Co

900 UNITED STATES PATENT OFFICE.

CHARLES H. HARRIS, of Cedartown, Georgia.

Improvement in Spring-Saddles.

Specification forming part of Letters Patent No. 163,769, dated May 25, 1875; application filed May 15, 1875.

To all whom it may concern:

Be it known that I, Charles H. Harris, of Cedartown, in the county of Polk and State of Georgia, have invented certain improvements in spring-saddles; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

(Here follows diagram marked p. 899.)

Figure 1 is a perspective view of a saddle with my improvements attached. Fig. 2 is a side elevation of the spring.

The object of my invention is to provide a saddle-spring which will give an easy and comfortable motion, and which will subject the material of the saddle to the least possible strain and wear; and it consists in attaching the forward portion of the leather forming the saddle-seat to a peculiar-shaped spring forming the pommel, and is an improvement on my patent No. 161,785, and dated April 6, 1875.

In order that those skilled in the art may make and use my invention, I will proceed to describe the exact manner in which I have carried it out.

In the said drawings, A is a saddle-tree; B, the bow; C, the spring forming the pommel, and D D the seat. Properly bolted to the top of the bow, and curving from front to rear, is a spring, C, constructed with the portion from or about *c* to the hook *c'* straight and rigid, which peculiar form of spring secures a vertical movement to the hook *c'*, and consequently to the seat of the saddle, thus avoiding the seesaw motion common in all spring-saddles. The seat of my saddle I make in two pieces, *a a*, as shown in Fig. 1, with the front connected by a metal bar, *m*, fitting in the hook *c'*. From this construction it is evident that to convert my spring-saddle into one having an ordinary seat, it is only necessary to lift the bar *m* from the hook *c'*, and the pieces *a a* rest snugly on the tree, and the seat is deprived of any spring. I prefer to quilt the seat-cover to prevent it from stretching. The cover having only two points of support, and one of them flexible, an easy and yielding seat is provided for the rider.

I am aware that saddles have been made with springs passing from the front through slots in the saddle-bow; but this is not my invention, as my object is to form not only a spring-pommel as well as a spring-seat to the saddle, which I accomplish by my arrange-

ment of the spring, but secure the material of the saddle against strain and wear, and avoid the seesaw motion common to spring-saddles.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

In a riding saddle, the spring C, constructed as described, and having the portion from *c* to *c'* rigid and straight, in combination with the pieces *a a*, and metal bar *m*, substantially as and for the purpose described.

CHAS. H. HARRIS.

Witnesses:
THOMAS C. CONNOLLY.
HENRY H. BURTON.

901 [British coat of arms.]

A. D. 1878, 9th July. No. 2751.

Specification of James Alfred Lamplugh and George Frederick Brown.

Bicycle saddles.

Printed by order of the commissioners of patents for inventions.

London: Published and sold at the commissioners of patents' sale department, 38, Cursitor street, Chancery Lane, E. C. 1879.
Price 6*d*.

902 [British coat of arms.]

A. D. 1878, 9th July. No. 2751.

Bicycle Saddles.

Letters patent to James Alfred Lamplugh and George Frederick Brown, both of Birmingham, in the county of Warwick, for the invention of "certain improvements in bicycles saddles."

Sealed the 20th December 1878, and dated the 9th July 1878.

Provisional specification left by the said James Alfred Lamplugh and George Frederick Brown at the office of the commissioners of patents on the 9th July 1878.

James Alfred Lamplugh and George Frederick Brown, both of Birmingham, in the county of Warwick. "Certain improvements in bicycles saddles."

Our invention consists in the construction or combination of certain parts, herein after described, whereby bicycle saddles are rendered elastic or yielding to the movement of the body when in application, thus imparting ease and facility to the rider.

We will now describe our invention thus:—

In making a bicycle saddle we adopt the ordinary seat, formed with the cantle at one end, and at the extreme the pummell; we

A.D. 1878. July 9. Nº 2751.
LAMPLUGH & BROWN'S Specification

(1 SHEET)

No. 207
Cope Mfg. Co.
&
G. J. Mfg Co.
} p 904.

FIG. 1.

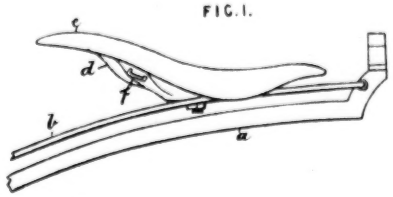


FIG. 2.

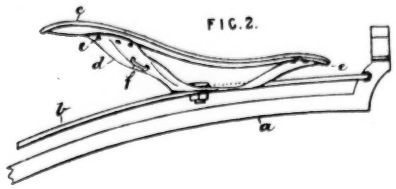


FIG. 4.

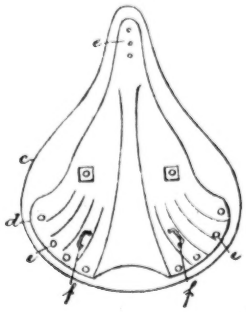


FIG. 3.

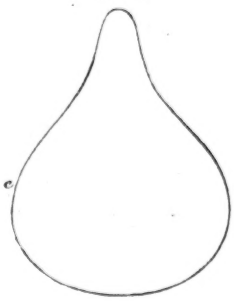


FIG. 5.

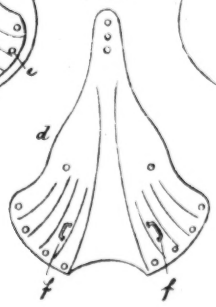


FIG. 6.

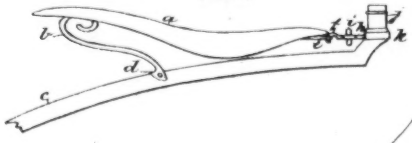
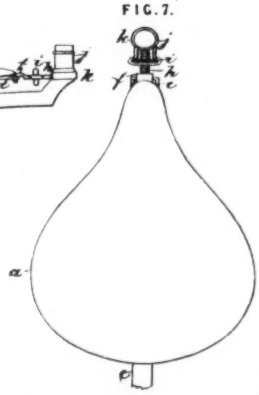


FIG. 7.



then employ a metallic plate in form somewhat approaching the said seat; the surface of this metallic plate is concaved, so that the forms corresponding to the pummell and cantle are in elevation, and to these we suspend the said seat, having secured the same by rivetting or otherwise. The sides of the metallic plate we arrange in form most suitable to our requirement.

The chief object in this our said invention is to construct a saddle by dispensing with rigidity, hitherto existing, and this is effected by suspending the seat, as above described, imparting elasticity to any movement the rider may require.

(Price 6*d*.)

903 Specification in pursuance of the conditions of the letters patent filed by the said James Alfred Lamplugh and George Frederick Brown in the Great Seal Patent Office on the 8th January 1879.

James Alfred Lamplugh and George Frederick Brown, both of Birmingham, in the county of Warwick. "Certain improvements in bicycle saddles."

Our invention consists in the construction or combination of certain parts, herein-after described, whereby bicycle saddles are rendered elastic or yielding to the movement of the body when in application, thus imparting ease and facility to the rider.

We will now describe our invention thus:—

In making a bicycle saddle we adopt the ordinary seat, formed with the cantle at one end, and at the extreme the pummell; we then employ a metallic plate in form somewhat approaching the said seat; the surface of this metallic plate is concaved, so that the form- corresponding to the pummell and cantle are in elevation, and to these we suspend the said seat, having secured the same by rivetting or otherwise. The sides of the metallic plate we arrange in form most suitable to our requirement.

The chief object in this our said invention is to construct a saddle by dispensing with rigidity, hitherto existing, and this is effected by suspending the seat, as above described, imparting elasticity to any movement the rider may require.

Hitherto bicycle saddles have been made with a rigid iron plate inside the seat, being between the seat and lining of same. We in our invention dispense with this said plate; we form the seat entir-ly of yielding materials, such as leather, silk, canvas, India-rubber, cloth, or any other material most suitable to our purpose, and then support the said yielding seat so that no part of the rider's thigh comes in contact with a rigid or unyielding substance.

And in order that this our said invention may be fully understood, we shall now proceed more particularly to describe the same, and for that purpose shall refer to the accompanying sheet of drawings, and to the letters of reference indicated thereon.

(Here follows diagram marked p. 904.)

Fig. 1 is a side elevation; Fig. 2, a side elevation partly in section; Fig. 3, a plan or front elevation; Fig. 4, a back elevation; Fig. 5, one part detached in elevation.

Fig. 6, a side elevation; Fig. 7, a plan view of same.

In Figs. 1, 2, 3, 4, 5, the same letters of reference indicate the same parts.

In Fig. 1 and Fig. 2 we illustrate our invention, "certain improvements in bicycle saddles," as applied to the parts of bicycles connected to the spring and backbone in the usual manner.

In Figs. 3, 4, 5, our invention is shewn detached.

"*a*" is the backbone, to which is connected the spring "*b*," and this carries the saddle or seat "*c*." "*d*" is a plate in parts corresponding in form to "*c*," to which it is connected by rivetting or otherwise, as shewn at "*e*," "*e*," "*e*," Fig. 2, but more clearly at Fig. 4; this said plate "*d*" is made of metal or other suitable material, metal by preference. "*f*," "*f*," are loops secured to "*d*," through which is passed the strap of the tool bag.

By reference to Fig. 2 the chief features of our claim is shewn.

The plate "*d*" is so concaved in its form that when the yielding seat or saddle "*c*" is connected to the extreme ends of "*d*," the said seat, or that part where the rider is located, is entirely suspended.

In Fig. 6 and Fig. 7 the letters marked thereon indicate the same parts.

We here illustrate our invention which dispenses with the olden method of connecting the seat or saddle to the spring or backbone by the employment of a spring, bracket, or support at the one end, while at the other end is a connecting or regulating screw and loop.

905 "*a*" is the seat or saddle, in construction as before described; "*b*" is a bracket for supporting "*a*" at the cantel end, and the base of which is connected to the backbone "*c*" at "*d*." At the pommell end we affix the loop "*e*" for receiving the catch "*f*," actuated by means of the regulating screw "*h*" and the nut "*i*," affixed to the head of the guide or steering fork "*j*" by the ring "*k*." This mechanism has the double purpose of securing and also supporting "*a*."

Having now described and ascertained the nature of this our said invention, and the manner in which the same is or may be performed, we would observe in conclusion that we do not limit ourselves to the precise details herein given, and shown on the accompanying drawings, as various modifications may be made therein while retaining the essential features of our said invention, but what we claim as new and desire to be secured to us by the hereinbefore in part recited letters patent is,—

First. The application and use of a plate of metal or other suitable material for the purpose of suspending the yielding seat or saddle, in combination with parts hereinbefore described, and illustrated by Figs. "1," "2," "3," "4," "5," or any modification thereof.

Second. The application and use of the supporting bracket in combination with parts for supporting the yielding seat or saddle,

and dispensing with a central bearing, as hereinbefore described, and illustrated by Fig. 6 and Fig. 7, or any modification thereof.

In witness whereof, we, the said James Alfred Lamplugh and George Frederick Brown, have hereunto set our hands and seals this thirtieth day of December, in the year of our Lord one thousand eight hundred and seventy-eight.

JAMES ALFRED LAMPLUGH. [L. S.]
GEORGE FREDERICK BROWN. [L. S.]

Witness,
THOMAS KENDRICK.

London: Printed by George Edward Eyre and William Spottiswoode, printers to the Queen's most excellent majesty. For her majesty's stationery office. 1879.

906 NORTHERN DISTRICT OF ILLINOIS, *ss:*

I, William H. Bradley, clerk of the circuit court of the United States for said northern district of Illinois, do hereby certify the above and foregoing to be a true and correct transcript of the record of all the proceedings had in said court in the cause wherein The Pope Manufacturing Company is the complainant and The Gormully and Jeffery Manufacturing Company, R. Philip Gormully, and Thomas B. Jeffery are the defendants, as the same appear from the records and files of said court now remaining in my custody and control.

Seal of Circuit Court U. S., Northern Dist., Illinois, 1855.

In testimony whereof I have hereunto set my hand and affixed the seal of said court, at my office, in Chicago, in said district, this nineteenth day of September, 1888.

WM. H. BRADLEY, *Clerk.*

Endorsed on cover: Case No. 13,263. N. Illinois C. C. U. S. No. 207. The Pope Manufacturing Company, appellant, *vs.* The Gormully & Jeffery Manufacturing Company, R. Philip Gormully, and Thomas B. Jeffery. Filed October 11, 1888.

Office Supreme Court U. S.
FILED.
MAR 7 1892
JAMES H. McKENNEY,
CLERK.

IN THE

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, A. D. 1891.

Term No. 207.

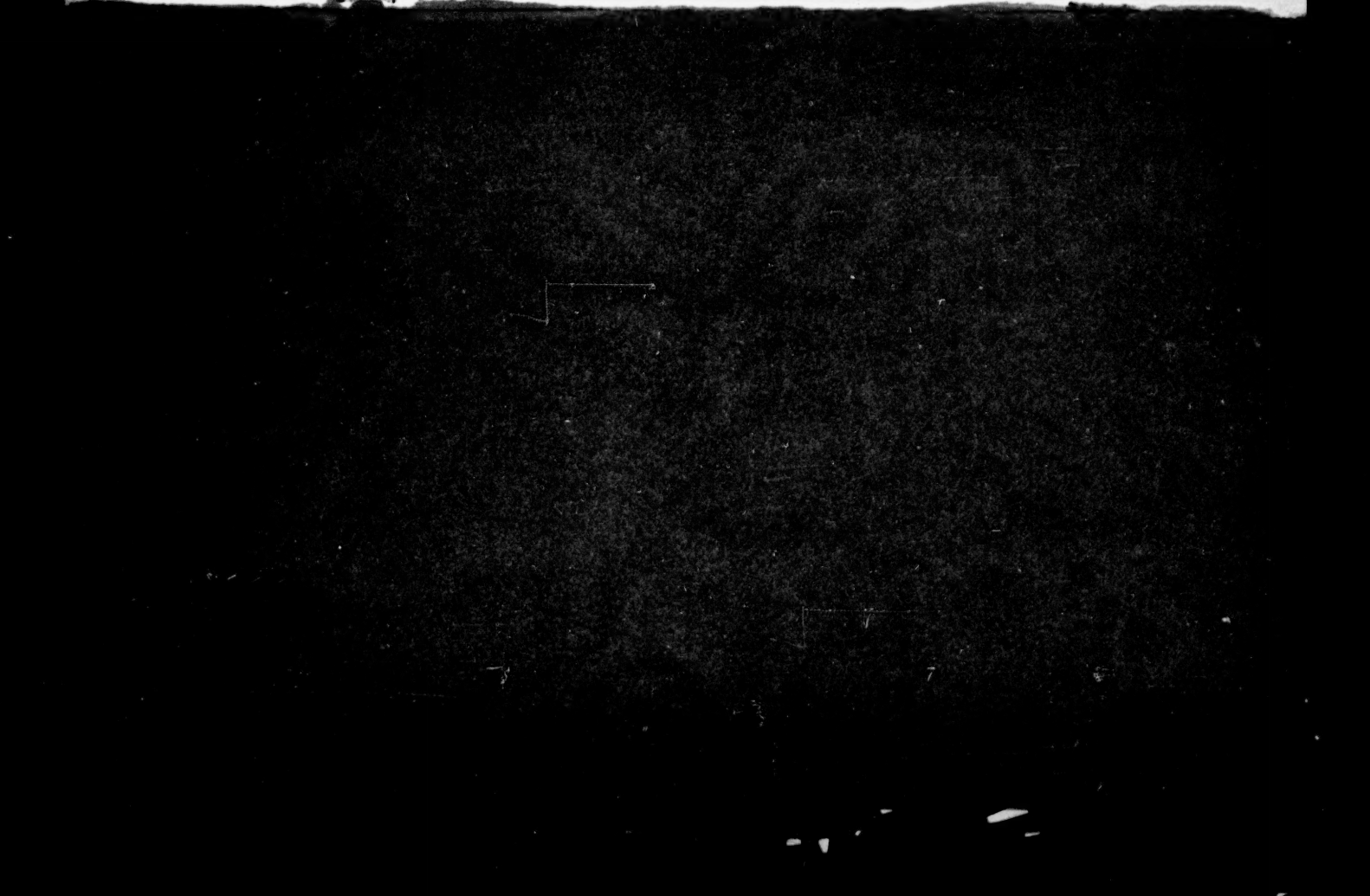
THE POPE MANUFACTURING COMPANY,
Appellant,

vs.

THE GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY, AND THOMAS B. JEFFERY,
Appellees.

EXCEPTIONS AND BRIEF AND ARGUMENT ON BEHALF OF APPELLANT.

L. L. COBURN,
OF COUNSEL FOR APPELLANT.



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Appellees.

EXCEPTIONS AND BRIEF AND ARGUMENT ON BEHALF OF APPELLANT.

EXCEPTIONS.

First. The court below erred in dismissing the bill for want of equity.

Second. The court erred in finding that there was no invention in the construction shown in the Shire patent over the devices shown in the patents of Bishop, of 1859; of Miller, of 1866; of Harris, of 1875, and of Lamplugh & Brown, of 1878.

Third. The court erred in finding that if the Shire patent be not void, the claim is limited in its scope to special devices shown, and that these special devices not being found in the defendants' machine, the defendants did not infringe.

Fourth. The court erred in finding that the inventions claimed in the first claim of the Kirkpatrick patent was substantially shown in the Veeder patent of 1882, the Shire patent of 1879, the Lamplugh & Brown English patent of 1878, and in the Fowler patent of 1881, or, if these old patents did not anticipate the Kirkpatrick patent, the Kirkpatrick patent could be sustained only for a special device, as for instance, a bifurcated forward spring, extending beyond the steering-head, and so limited that it does not include or cover the saddles made by the defendants.

STATEMENT OF CASE.

The bill of complaint in this case is in the usual form of bills brought to recover for the infringement of letters patent, and prays for an accounting and an injunction. The patents declared on are No. 216,231, granted to John Shire, June 3, 1879, for an improvement in velocipedes, and No. 314,142, granted March 17, 1885, to Thomas B. Kirkpatrick, for bicycle saddle. These patents are printed pages 485 and 487, respectively, of printed record.

The court found the title to said patents to be in the complainant. The defenses made to the bill are: First, that the patents were void for want of novelty, and, second, that the defendants do not infringe. The second claim of the Shire patent reads as follows:

"2—In a velocipede, the adjustable hammock-seat J "substantially as set forth."

The first claim of the Kirkpatrick patent reads as follows:

"1—The combination with the perch or backbone of a "bicycle or similar vehicle, of independent front and "rear springs secured to such perch or backbone and a "flexible seat suspended directly from said springs at the "front and rear, respectively, substantially as set forth."

The following is a copy of Fig. 1 of the Shire patent:

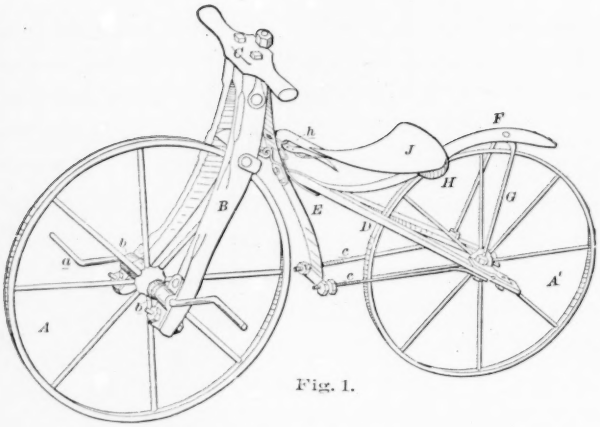


Fig. 1.

SHIRE PATENT SADDLE

Shire says in his patent, that this invention "consists, "first, in the peculiar construction and application of the "spring; second, in the construction or adaptation of the "seat, so that it is brought into close proximity to the "driving-wheel, thus allowing a wheel of greater diameter "to be used than when constructed in the ordinary manner; "and in the peculiar construction and arrangement of the "various parts, all as more fully hereinafter described." He also states: "To the top of this fender F is rigidly "secured a seat-block H, to which is secured one end of "the adjustable hammock-seat J, the opposite end of "which is provided with a strap and buckle, *h*, to engage "the loop *i*, projecting from the rear face of the spring." He also says: "It will further be seen that by the use of "an adjustable hammock-seat, as described, the seat may "be brought into closer proximity to the driving-wheel "than when constructed in the ordinary manner, which "will admit the use of a driving-wheel of great diameter." Claim 2 of the Shire patent is for an adjustable ham-

mock-seat, J, in a bicycle. A hammock-saddle is a flexible saddle that has no tree or under frame, as distinguished from a suspended saddle-seat, suspended over a tree or frame or a metallic or wooden saddle. Shire's patent shows this kind of saddle, one end of which is rigidly attached to a block, while the other end is suspended to a movable fastening, which makes the seat adjustable, by which the slack in the saddle can be taken up, it has no tree or under part. The position of the saddle is also such as to carry it forward, close to, but not over the front wheel of the bicycle, so that the rider's seat is further forward on the bicycle than when other saddles were used.

The court below held that this construction of saddles was substantially found in the Bishop patent (page 516 of printed record), which shows a riding saddle with a wooden tree, having a seat made of leather, suspended at either end upon elastic steel bars. The idea of Mr. Bishop was that the rider would sit upon this leather seat, suspended over the saddle-tree on these elastic steel bars, and receive a sort of a rocking movement under the motion of a horse, and that this construction would ease to a great extent the sudden jar attending the gait known as a trot. This patent has no suggestion of a velocipede-saddle, beyond the mere fact that it has a flexible seat to the saddle.

The Miller patent (page 517 of printed record) also shows a riding-saddle with a wooden tree, and posts extending upward on said saddle-tree, with a frame for a saddle-seat, suspended on bearings at the top of said posts. This patent does not even show a flexible seat; neither does it provide for an adjustment of the seat. He says in his patent:

"Q refers to the seat-frame. Said frame is to be cast "of brass or malleable iron; can be made of wrought "iron. It should be about three-eighths of an inch in "thickness by three-quarters in breadth for full-sized "saddle; others in proportion to size."

Evidently Miller had no idea of such a saddle as Shire's patent shows. He certainly did not show and describe one in his 1866 patent.

Currey's patent, No. 63,864, (see p. 521 of printed record) also shows a riding saddle with a wooden tree, and a leather seat suspended above the tree. Currey's invention was entirely upon the construction of the metallic or wooden portion of a saddle. He shows in the drawing, a seat, Z, suspended above the side-bars, S, of a saddle. He does not state whether it is a flexible seat, but, if it is, there is no provision shown for its adjustment, and it clearly is not the Shire invention, Shire having shown and described a hammock saddle, adapted to be attached to a bicycle, and having certain features which are not shown in the Currey patent.

The Harris patent, (see p. 523 of printed record) also shows a riding saddle. It has a wooden tree, A, carrying front and rear posts, between which is suspended above the tree a flexible saddle-seat. There is no means of adjusting said saddle. It is like the Bishop saddle in that it suspends the leather seat above the wooden tree of a riding saddle. It is not the same class of saddles as the Shire invention, and does not contain the devices which are made the subject-matter of claim 2 of the Shire patent. It is evident that no one would be able to use either of these riding saddles on a velocipede, without inventing mechanisms and devices, and making very material changes in said saddles to produce the Shire invention.

The only other patent the court refers to in connection with the Shire patent, is the Lamplugh & Brown, English patent of 1878. (Page 525.) This patent illustrates and describes a saddle-seat for bicycles, and the seat represented and described is a suspension seat, it is not a hammock-seat. The seat proper is made of flexible material, but it has beneath it a plate, concave in shape, on its upper side and extending from the rear to the front of the flexible seat. The forward and rear ends of the flexible seat are permanently attached to the respective ends of the plate beneath, the same as in the horse-saddles above referred to. The flexible seat is in no sense adjustable with relation to its two points of attachment.

The modification shown in Figs. 6 and 7 of this patent dispenses with the spring-bar over the backbone. The suspension seat, instead of being arranged upon the spring-bar, is attached at its rear end directly to the backbone, while its front end is upon a bracket, and it has an adjustable screw, by means of which the whole seat can be drawn forward.

The complainant's experts (see pp. 136 and 189 printed record) clearly explain the construction found in the Lamplugh & Brown patent, and point out that the Lamplugh & Brown saddle is a suspension saddle, and not in any sense an adjustable hammock-saddle. It is the same as a saddle-seat suspended on a tree or frame, and the whole saddle, with the tree and frame, is movable forward and backward, and is not an adjustable hammock-saddle, like that shown in the Shire patent.

The defendant's saddle has an adjustable hammock-seat attached to separate and independent springs, which are made adjustable relatively to each other, and the

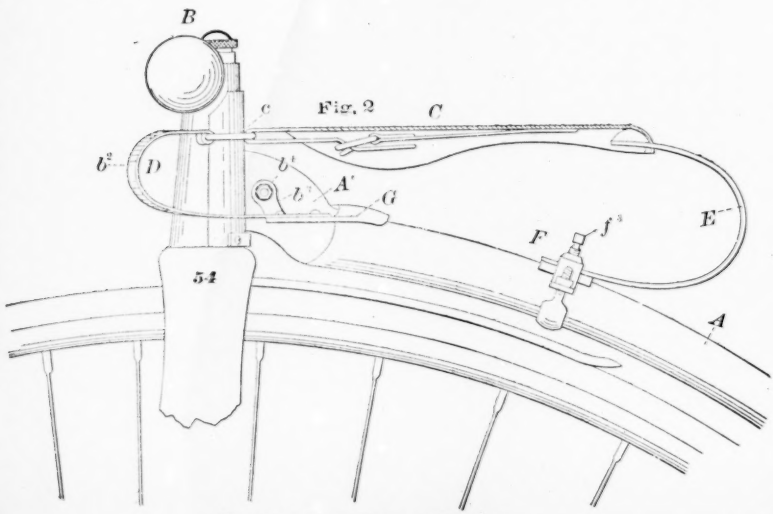
saddle, therefore, constitutes an adjustable hammock-seat operating in every way as that described and shown in the Shire patent, and made the subject-matter of the second claim thereof.

COMPLAINANT'S EXHIBIT KIRKPATRICK PATENT.

(See p. 487 printed record.)

Kirkpatrick says that his invention "relates to that "class of bicycle saddles in which a flexible seat is sus- "pended directly from a saddle spring or springs without "the use of an intermmediate saddle-frame or tree; and "my invention consists in a peculiar arrangement of front "and rear springs secured independently to the reach or "backbone of the machine in connection with the flexible "seat suspended at the front and rear from said springs."

The following is a copy of Fig. 2 of this Kirkpatrick patent:



KIRKPATRICK PATENT SADDLE

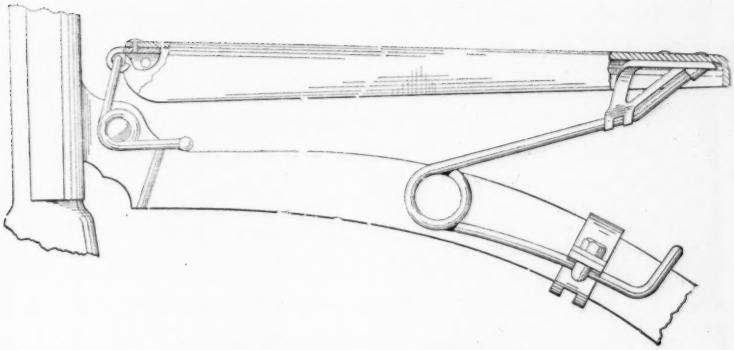
He has six claims in his patent. In claim one he covers the construction, which consists of the combination, "1. Of the backbone of the bicycle, or similar vehicle; "2. Of independent front and rear springs, secured to "said reach or backbone," and "3. A flexible seat "suspended directly from said springs at the front and "rear, respectively, substantially as set forth."

The court below found that the Shire patent has a flexible seat suspended from springs or fastenings at each end.

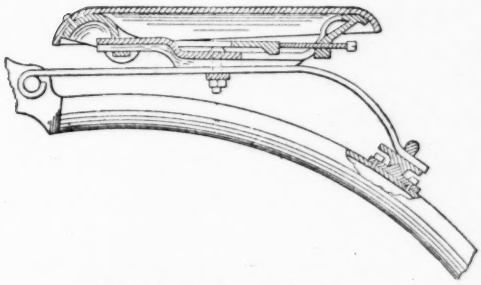
It was true that it had a flexible seat, secured to fastenings at each end, but it did not have a flexible seat, secured to the independent springs at each end, attached directly to the backbone of the bicycle.

The court below held that the idea of suspending such flexible seats was shown in the Veeder patent, in the Shire patent, and in the Lamplugh & Brown English patent. And even if these patents did not show a suspension from springs at each end of the saddle, the hammock-seat is clearly shown in the Fowler patent of 1881. (See page 503, printed record.) This was an error. The Fowler patent does not show a flexible seat, but a rigid seat, mounted on a single bar. The seat being rigid and inflexible, has no possible means of adjustment whereby the shape of the seat may be changed, and is an entirely different kind of saddle from that shown in the Kirkpatrick patent. Kirkpatrick was the first to combine a hammock saddle seat and two springs, one being a front spring, and the other a rear spring, and attach those springs directly to the backbone of a bicycle, by means of adjustable clips, and this device was immediately adopted by bicycle manufacturers as a cheap, simple and desirable construction of a bicycle saddle. This combi-

nation of devices is not shown in any prior structure. Each of the elements is shown in some one of the prior structures, but the combination as shown and described in claim one of the Kirkpatrick patent, is not shown in any of the prior patents. Veeder, in the patent owned by the complainant, more nearly approached the Kirkpatrick construction than any of the other prior inventors, but he did not so construct the springs that they were adapted to be attached separately directly to the backbone of the bicycle, and be adjustable thereon. Veeder adopted the Shire invention in that he had an adjustable hammock-saddle, combined with a bicycle, but he improved it by using a front and rear spring under the adjustable hammock-saddle, making the springs independent of each other, and adjustable relatively to each other. Kirkpatrick improved the Veeder construction, by adapting the springs to be connected directly to the backbone, separately, making an improved saddle, for which he obtained a patent. The defendants use the Kirkpatrick construction. They have the Shire invention, as improved by Kirkpatrick. Their device has the adjustable hammock-saddle of Shire, combined with two separate springs, one supporting each end of the saddle-seat, the springs being attached directly to the backbone of the bicycle. This final form of a bicycle-saddle was first reached by Mr. Kirkpatrick. Mr. Kirkpatrick had other claims upon the saddle construction, covering the various devices in his machine, but the first claim of his patent was clearly and distinctly for this combination of devices, consisting of the adjustable hammock-saddle, supported by the two springs attached directly to the backbone of the bicycle. The defendants clearly used this construction, adopting almost the identical form of bearings and attachments to the backbone used by Kirkpatrick.



DEFENDANT'S CHAMPION SADDLE.



DEFNDANT'S IDEAL SADDLE.

The court below, therefore, erred in dismissing the bill for want of infringement, and in finding that the defendants had not infringed the Kirkpatrick patent.

Furthermore, it was stipulated and agreed in the ninth paragraph of complainant's contract Exhibit No. 3 (see p. 264 printed record), that the party of the second part would not "import, manufacture, or sell, either directly "or indirectly, any bicycle, tricycle, or other velocipede, "or the pedals, saddles, bearings, rims, or other patented "parts or devices containing any of the inventions or "claims in either of the hereinbefore recited letters pat-

"tent, nor make, use or sell, directly or indirectly either "* * * (*i*) saddles adjustable fore and aft, or (*k*) "saddles having a flexible seat and means of taking up the "slack."

The attention of the court is called to the fact that it was contemplated that these adjustable hammock-saddle patents of complainant's, were reserved exclusively for the complainant to use in making hammock saddles for bicycles. The saddles having rigid seats or suspended seats, could be made by the defendants, and the defendants made such saddles under their license, and refrained from making these adjustable hammock saddles, till they commenced to expand their business, and include the styles of machines which they had specifically agreed not to make; they then adopted the styles of saddles shown in the defendants' machines, having adjustable hammock seats, with front and rear springs attached directly to the backbone of the bicycle, and not only infringed these patents, but also violated the agreement as contained in the ninth clause thereof.

The court also erred in dismissing the bill for want of equity, because this clause of agreement was ignored.

L. L. COBURN,
for Appellant.

Office Supreme Court U. S.
FILED,
MAR 7 1892
JAMES H. McKENNEY,
CLERK.

IN THE

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, A. D. 1891.

No. 207.

THE POPE MANUFACTURING COMPANY

vs.

THE GORMULLY & JEFFERY MANUFACTURING COMPANY, R. PHILIP GORMULLY AND THOMAS B. JEFFERY.

IN EQUITY.

Appeal from the Circuit Court of the United States for the Northern District of Illinois.

BRIEF AND ARGUMENT FOR APPELLEES.

BY

C. K. OFFIELD.

IN THE

Supreme Court of the United States.

OCTOBER TERM, A. D. 1891.

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IN EQUITY.

Appeal from the Circuit Court of the United States for the Northern District of Illinois.

STATEMENT OF CASE.

This is a bill in equity which has for its foundation solely two Letters Patent relating to alleged improvements in saddles for velocipedes or bicycles. There is no allegation in this bill of complaint asserting any contract relations between the parties litigant, and the case is wholly unembarrassed by any asserted license agreement and is simply the usual bill of complaint filed in patent causes.

The Letters Patent asserted in the Bill are Letters Patent of the United States granted John Shire, dated June 3d, 1879, No. 216,371.

Letters Patent of the United States granted Thomas J. Kirkpatrick, dated March 17, 1885, No. 314,142.

The Shire Patent.

The claims of this Shire patent are four in number. The second claim alone, however, is asserted against the appellees, that claim being as follows:

"2. *In a velocipede, the adjustable hammock seat* J, "*substantially as set forth.*"

The defenses to this suit upon the Shire patent are three in number.

1st. *Appellant is without title to the Shire patent.*

2d. *Such patent is invalid as to its second claim.*

3d. *Appellees do not infringe.*

Appellants' Title.

Appellant professes to derive its title to this Shire patent from one Thomas J. Kirkpatrick, and the record shows that the only title that said Kirkpatrick ever had or obtained from said patentee Shire passed by the following paper:

"Be it known that I, John Shire, of Detroit, Wayne "County, Michigan, for and in consideration of one dollar "and other valuable considerations to me paid, do hereby "sell and assign to Thomas J. Kirkpatrick of Springfield, "Clark County, Ohio, all my right, title and interest in "and to the Letters Patent on Velocipedes granted to me "June 3, 1879, and No. 216,231, including all rights for "past infringement so far as said patent relates to or "covers the adjustable hammock seat, or saddle, except "the right to use said seat or saddle in connection with

"the velocipede made by me under said patent, in my "business at Detroit."

"Signed and delivered at Detroit, this 10th day of July, "1884."

"JOHN SHIRE."

"Witness, J. M. EMERSON."

We respectfully submit that this paper is one of extreme vagueness upon its face, and only pretends to assign certain undefined elements, inventions or parts of said patent and only such parts of said patent, and so far as said patent relates to or covers the adjustable hammock seat or saddle, the assignor even then reserving the right in himself to use such seat or saddle in his business. The principal body of the patent does not relate at all to adjustable hammock seats or saddles; but one of its claims makes any reference to such seat or saddle; and it is the contention of the appellee that this paper passes no title known to the patent law or become known under any of the decisions, by which an assignor, of whatever interest is expressed in said paper, can alone maintain a suit.

Assuming, which appellees do not admit, that this paper is, as a matter of fact, an assignment of the second claim of Shire, it was found in the court below that such paper was sufficient upon which to base title for suit. The exact question presented by this paper appeared to be new at the trial of the case below and the court held that: "Each claim of a patent standing by itself is a separate "patent, for the device covered by that claim, and it "seems to us that it is entirely competent for a patentee "to assign the exclusive right to use so much of the pat- "ent as is covered by any one of its claims, and this be- "comes an operative assignment under the patent laws to "transfer the patent covered by that claim." It did not

appear to us at the time of the argument of the case that this conclusion was the law under the statute and authorities relating to the assignment of patents; and appears to us now that this court has since decided this question adversely to the above conclusion in the case of *Waterman* v. *McKenzie*, 138 U. S., 255. In that case Mr. Justice GRAY stated the rule as follows:

"Every patent issued under the laws of the United "States for an invention or discovery contains 'a grant to "the patentee, his heirs and assigns, for the term of seven- "teen years, of the exclusive right to make, use and "vend the invention or discovery throughout the United "States and the Territories thereof.' Rev. Stat., Sec. "4884. The monopoly thus granted is one entire thing, "and cannot be divided into parts, except as authorized "by those laws. The patentee or his assigns may, by "instrument in writing assign, grant and convey, either, "1st, the whole patent, comprising the exclusive right to "make, use and vend the invention throughout the United "States; or, 2d, an undivided part or share of that ex- "clusive right; or, 3d, the exclusive right under the "patent within and throughout a specified part of the "United States. Rev. Stat. Sec. 4898. A transfer of "either of these three kinds of interests is an assign- "ment, properly speaking, and vests in the assignee a "title in so much of the patent itself, with a right to sue "infringers; in the second case, jointly with the assignor; "in the first and third cases, in the name of the assignee "alone. Any assignment or transfer, short of one of "these, is a mere license, giving the licensee no title in "the patent, and no right to sue at law in his own name "for an infringement. Rev. Stat., Sec. 4919; *Gayler* v. "*Wilder*, 10 How., 477, 494, 495; *Moore* v. *Marsh*, 7

"Wall. 515. In equity, as at law, when the transfer "amounts to a license only, the title remains in the owner "of the patent, and suit must be brought in his name, "and never in the name of the licensee alone, unless that "is necessary to prevent an absolute failure of justice, as "where the patentee is the infringer, and cannot sue him-"self. Any rights of the licensee must be enforced "through or in the name of the owner of the patent, and, "perhaps, if necessary to protect the rights of all parties, "joining the licensee with him as a plaintiff. Rev. Stat., "Sec. 4921. *Littlefield* v. *Perry*, 21 Wall., 205, 223. "Paper Bag cases 105 U.S., 766, 771; *Birdsell* v. *Shaliol*, "112 U. S., 485–487. And see *Renard* v. *Levinstein*, 2 "Hem. & Mil., 628."

We certainly conclude from the above, that each patent is a unit, and indivisible in the line of its claims, and that it is error to assume or assert "that each claim of a patent "standing by itself is a separate patent for the devices "covered by that claim." There are, in many instances, grounds of contention as to what a claim does mean and what it does cover, such fact being determined frequently by the antecedent art, and not by the face of the patent. And to permit the patent to be divided up and parceled out by a large number of assignments relating to particular claims, under the supposition that each claim is a patent itself, would eject into the patent system such a confusion of relation of rights, as not contemplated by the patent laws, even if such subdivision could, as a matter of fact, be possibly made.

The decisions in many of the principal courts of the country, we contend, clearly establish this conclusion, as for example:

"An assignment which does not convey to the assignee

"the entire and unqualified monoply which the patentee "holds in the territory specified, or any undivided inter- "est in the entire monopoly, is a mere license."

Sanford v. *Messer*, 1 Holmes, 149.

"An assignee must have exclusive sectional interest to "maintain suit in his own name."

Gaylor v. *Wilder*, 10 How., 477.

"Assignments can divide patent rights only in point of "locality."

Goodyear v. *N. Y. Central R. R. Co.*, 1 Fish., 626.

Suydam v. *Day*, 2 Blatch., 20.

"Patent rights can only be divided according to United "States patent law."

Kempton v. *Bray*, 99 Mass., 350.

The most that can be contended for this paper is that appellant has a license thereunder to use the invention of the Shire patent as far as such invention relates to adjustable hammock seats or saddles, and that the legal title to the patent in question remains still in the patentee Shire; but mere licensees should not be joined as plaintiffs. *Grover & Baker Sewing Machine Co.* v. *Shoat*, 2 Fish., 112, and in the language of the decision in the case of *Telegraph Co.* v. *City of Brooklyn*, 22 O. G., 1978. "The rule is un- "questioned that where one person has the legal title to a "patent, and another an equitable title therein, both "must be made parties to a suit in equity to restrain in- "fringement."

II.

THE SHIRE PATENT INVALID AS TO ITS SECOND CLAIM.

This Shire patent appears on page 508 of the record, and it will be at once seen that it represents a velocipede of awkward form of construction; that the central connection between the front and rear wheels is of a hollow or grooved form; that this space must be occupied by the rider and of necessity must be bridged by a saddle of peculiar construction, having for one of its elements necessarily adjustability. The patentee, Shire, does not describe, nor does the claim express any other form of seat, except "the hammock seat J," and the feature of adjustability was not for the purpose of taking up the slack of the seat, but to bring the seat in closer proximity to the wheel.

The appellant has attempted to idealize and expand this claim to meet and cover a bicycle seat of the flexible or hammock construction, that is, adjustable for any purpose, irrespective of the particular means or devices for accomplishing this end. Appellant is forced to take this position, otherwise there could be no contention of the employment of the Shire saddle in the appellee's devices. Whatever the position taken by the appellant as to this matter, the old art shows all that can be dreamed out of Shire in this manner.

Old Saddle Art.

Appellee's Exhibit Bishop, 1859, Saddle Patent.

This patent is found on page 516 of the record. The saddle of Bishop is a riding saddle, not perhaps for a velocipede, but there is no difficulty in placing it upon a

velocipede, if so desired. It has a spring support; has as much of the hammock element in it as Shire, and if not adjustable as shown in the drawings, it is so shown as to be made adjustable if so desired. (Appellee's Expert Dep. Jeffrey, Rec., 319, Powers, 419.)

Appellee's Exhibit, Miller 1866 Saddle Patent.

This patent is found on page 518 of the record. It is a suspension saddle and has in it as much of the hammock element as Shire. It has also a leaf-spring support, as the Shire patent. The patent is silent as to the material of the seat, as is also the patent of Shire. (Appellee's Expert Dep. Jeffrey Rec., 316; Powers, 419.)

Appellee's Exhibit, Curry 1867 Patent.

This patent is found beginning page 521 of the record. It is a riding saddle, a suspension saddle as to its flexible parts, and could be easily made adjustable if desired by the manipulation of the lacing thongs which appear as a part of its flexible seat. (See Jeffrey, Rec., 313.)

Appellees Exhibit Harris 1875 Saddle Patent.

This patent also exhibits a riding saddle of the hammock variety, flexible, and having a certain capability of adjustment at its pommel end, the same as exhibited by Shire. (See Jeffery, Rec., 311; Powers, Rec., 418.)

Appellee's Exhibit, Lamplugh & Brown, 1878, Saddle Patent.

This is an English patent, and is found on page 525 of the record. This patent meets exactly and precisely the most enlarged and amplified statement of invention that

appellant can claim for the Shire patent. The patent relates solely to saddles for bicycles, the inventors thus stating the object of the invention: "The chief object of "this our said invention is to construct a saddle by dis- "pensing with rigidity, hitherto existing, and this is effec- "ted by suspending the seat, as above described, impar- "ting elasticity to any movement the rider may require."

The hammock element is most perfectly exhibited in this Lamplugh & Brown patent. Its adjustability is obtained by a much more perfect and certain construction than exhibited in Shire. A reference to Fig. 6, shows conclusively the certainty of the position here contended for, as to this patent. (See Jeffery, Rec., 312, Powers, Rec., 418.)

Appellees do not infringe.

An examination and comparison of appellees bicycle saddle devices with this Shire patent shows at once that there is no similarity of construction between the Shire saddle and the appellee's devices, except that generality of construction shown in the old art. Appellees' saddle has no adjustability in any sense identified by the Shire patent, and the presence of any such capability for adjustability as contemplated by Shire would ruin appellee's saddle. All that appellees' saddle possesses is a capability under certain desired conditions of taking up the slack of the saddle, and this is effected by the forward horizontal moving spring which always acts as a straining device, in tightening the saddle, and prevents the necessity of any adjustment whatever thereof. Appellee's experts Jeffery and Powers have amplified and given reasons for such conclusions as appears on pages 310 and 417, respectively, of this record. In the trial of the case below the judges

found this Shire patent of doubtful validity, and whether valid or not, there was no infringement thereof by the appellees, the language of the judges so finding being:

"It therefore seems to us that so far as the hammock "seat was concerned, and making such seat adjustable by "means for taking up the slack or even making it mova- "ble upon the reach of the bicycle, it had already been "anticipated to such an extent in the art as to make this "claim of the Shire patent void, or if not void, only valid for "the special device which was used, and, if valid for the "special device, then clearly the defendant's device by "which the hammock saddle is suspended at either end "does not infringe this second claim of the Shire patent."

Appellant's Kirkpatrick Patent.

This patent is found upon page 487 of the record. Its claims are four in number, but only the first is urged against any saddle of the bicycle structures of appellees. We now quote the first claim of this Kirkpatrick patent.

"*1. The combination, with the perch or backbone of a "bicycle or similar vehicle, of independent front and rear "springs secured to said perch or backbone and a flexile "seat suspended directly from said springs at the front and "rear, respectively, substantially as set forth.*"

The defenses to this Kirkpatrick patent are two in number.

1st. The patent is void by reason of the absence of patentable novelty.

2d. Appellees do not infringe.

An examination of this Kirkpatrick patent, in view of the old art shows clearly that the only new thing exhib-

ited in this patent is the extending and bringing forward of the bifurcated or divided spring, so that the forward spring action of the saddle may be in front of and at the side of the steering head, for the purpose of permitting as close a juxtaposition as possible of the forward end of the saddle with the steering head; and even under these circumstances, the patentee does not claim his invention to be anything other and broader than the peculiar devices that he employs for accomplishing this result. At the beginning of his specification, Kirkpatrick says: "My "invention consists in a peculiar arrangement of front and "rear springs secured independently to the reach or back-"bone of the machine in connection with the flexile seat "suspended at the front and rear from said spring." Again, the Kirkpatrick specification says: "In order to "extend the suspended flexile seat as far forward as pos-"sible and at the same time secure the full elasticity of "the forward spring D, I construct the said spring with "two wings *b' b''* adapted to extend forward of the head "B and turn upward and backward to connect with the "forward end of the seat C."

A search through the Kirpatrick specification and claims shows that Kirkpatrick neither described or suggested any other form of spring than above described or any form of spring for any purpose other than the above. It is practically contended by the appellant that this first Kirpatrick claim shall be so construed as to cover the suspension of a saddle at its front or rear ends by independent springs. It will be evident hereafter that such contention must be made for this claim if it is expected to hold appellees as infringers thereof. See Jeffery Rec., 318. Powers' Rec., 418.

Old Saddle Art.

A review of this old art shows that the only new thing exhibited in Kirkpatrick was the extending of the bifurcated springs, carrying the saddle out beyond the steering head and this was not new, except in a bicycle.

Appellees Exhibit Fowler 1881 Saddle Patent.

This patent is found on page 503 of the record. It relates to a tricycle saddle, but will apply equally as well to a bicycle, and the first claim of Kirkpatrick is not limited to a bicycle saddle, but extends to "a similar vehicle." This Fowler 1881 patent, as illustrated fully in Figs. 1 and 3, shows a tricycle with a backbone, independent front and rear springs secured to the backbone, and a flexible saddle suspended directly from the springs over the backbone. It has everything of the Kirkpatrick construction except the forward bifurcated spring.

Appellees' Exhibit Fowler 1880 Saddle Patent.

This patent is found on page 488 of the record. It also relates to a tricycle structure, but it has a perch or backbone substantially of the same character as shown in Kirkpatrick, and has mounted thereon a flat grooved leaf rear spring and an independent front spring secured to the front of the saddle, and connecting with the backbone. These springs carry a suspension saddle with a seat of certain flexibility, and covers broadly everything found in Kirkpatrick except the forward bifurcated spring. (See Jeffery, Rec., 315, 319.

APPELLES' EXHIBIT VEEDER 1882 SADDLE PATENT.

This patent is found upon page 510, record. It has a front and rear spring carrying the flexible saddle seat, such springs being attached above directly and independently to the backbone of the bicycle. It does not, however, have its forward spring bifurcated and extending beyond the steering head. (See Jeffery, Rec., 314. Powers, Rec. 419.)

APPELLEES' EXHIBIT BISHOP 1859 SADDLE PATENT.

This patent is found upon page 516 of the record. If any breadth of construction is to be given to Kirkpatrick as covering the suspension of a flexible saddle seat by front and rear springs, all this is shown in this Bishop patent. (See Jeffery, Rec., 319; Powers, Rec., 419.)

APPELLEES' EXHIBIT MILLER 1866 SADDLE PATENT.

This patent is found on page 517 of the record. It relates to a riding saddle, but could be placed with entire adaptability upon a tricycle structure. It exhibits front and rear sustaining springs with intervening flexible seat. It also shows the forward springs separated or bifurcated, and could be applied to the perch of a tricycle with these forward bifurcated springs upon each side of the steering head, and would then be the precise contemplated structure of Kirkpatrick. (See Jeffery, Rec., 320; Powers, Rec., 419.

Appellees Exhibit Lamplugh & Brown 1878 Saddle Patent.

This patent is found on page 524 of the record. It exhibits everything contended for by this Kirkpatrick patent, except the bifurcated forwardly extending springs. It has a flexible seat. It has a front and rear spring supporting such seat. It has such supporting springs connected directly and indirectly with the backbone as shown in Fig. 2 of the patent. (Powers, Rec, 418.)

Appellees' Exhibit Shire 1879 Saddle Patent.

This patent is found upon page 485 of the record, and shows a flexible saddle suspended at its front and rear to spring connections and connected with the backbone of a velocipede and anticipates any broad construction that can be given to Kirkpatrick.

Appellees do not Infringe.

An examination of either of the bicycle saddles of appellees in evidence as an exhibit, at once determines the fact that none of appellees' saddles contain the invention of the Kirkpatrick patent or the devices of its first claim, principally for the following reasons.

1st. They have not the leaf spring of Kirkpatrick, but coiled wire springs.

2d. Appellees' springs do not extend forward of the steering head of the bycicle but the entire front spring is located in the rear of such steering head.

3d. The front and rear springs of appellees' saddles are located under such saddle while the principal portion

of the springs of Kirkpatrick are designedly located forward and in the rear of the saddle.

These differences and other effects as matters of fact are set forth in appellees' exhibit testimony Jeffery, Rec, 310, and Powers, 417.

It should be remembered also in this connection that appellees are manufacturing their saddle devices herein complained of as an infringement, under two Letters Patent relating to bicycle saddles purchased and owned by them, the first being: Letters Patent to C. E. Duryea, dated February 19, 1884, No. 293,725. (See Jeffery Dep. Rec., 320, 321); and Letters Patent to Freeman Lillibridge, dated March 4, 1884, No. 294,645, printed in this record upon page 506, as appears by the deposition of Mr. Jeffery. (Rec., 374.)

In the trial of the case in the court below this Kirkpatrick patent was found of doubtful validity; if valid at all, only valid as to specific devices which the appellees saddle constructions do not contain, the opinion stating:

"It may be that this Kirkpatrick patent can be sus-
"tained as a special device for the bifurcated forward
"springs which are carried beyond the steering head, and
"thereby the seat of the saddle is brought somewhat
"farther ahead than is shown in saddles that are fastened
"to springs abaft the steering head or post, but the de-
"fendants do not use that form of bifurcated springs,
"and if the patent can be sustained, it must be for that
"special device and nothing else. Hence we conclude
"that while it is possible that this first claim of the patent
"may not be absolutely void for want of novelty, yet it
"does not cover the saddles used by the defendant, nor